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ANNUAL REPORT

OF

S. HARRISON SMITH,

SURVEYOR

OF THE

City and County of San Francisco,

FOR THE

FISCAL YEAR ENDING JUNE 30, 1887.

SAN FRANCISCO:
WM. M. HINTON & CO., PRINTERS, 536 CLAY ST.
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REPORT

OF THE

CITY AND COUNTY SURVEYOR.

Office of City and County Surveror,
San Francisco, Cal.
June 30th, 1887.

To the Honorable the Board of Supervisors
of the City and County of San Francisco:

Gentlemen:—In compliance with your Resolution No. 19,581 (New Series,) passed on June 13th, 1887, I have the honor to submit the following report:

INTRODUCTORY REMARKS.

Heretofore, it has, I believe, been the custom of this office to submit simply a statement of the number of surveys made and of certificates issued during the year. This, at first glance, would seem to be all that could be required, as the City has nothing to do with either the receipts or the disbursements of the office. But, in my opinion, the responsibilities of the head of any department are the same, whether his remuneration be derived from a stated salary or from fees. I therefore consider that the report of any department should at least give some history of the work performed and some sort of inventory of City property intrusted to its keeping, together with such suggestions from the head of the department as may, to him, seem necessary for its working or improvement. Another reason for publishing a full and complete report of the operations of this office is, that much valuable and useful information gathered from year to year may be placed in such a form as to be accessible to the general public.

Following out this idea the first thing of importance that presents itself for notice is an outline of the history of our City Surveys as begun and from time to time extended. This, I regret to say, will, of necessity, be brief, as the requisite data is much scattered and the time at my disposal for its compilation has been limited.

OUTLINE HISTORY OF THE CITY SURVEYS.

The first survey of San Francisco (or as it was then called, Yerba Buena,) mas made in 1839 by Juan Vioget, a surveyor, under instructions issued by Governor Alvarado to Alcalde F. DeHaro. This survey was bounded by Montgomery, Pacific, Sacramento and Dupont streets. From this survey the City was extended from time to time by different surveyors, until 1855 it had extended as far west as Larkin and Ninth (then Johnston) streets, and was in subdivisions known respectively as the fifty and the one hundred vara surveys. The fifty vara survey covering that portion lying north of Market-street and receiving its name from the fact that each block consists of six fifty vara lots or six perfect squares of 137 feet 6 inches in each direction, these arranged so as to have the length of two lots north and south, and of three lots east and west. The one hundred vara survey, or that covering the portion of the then city, located south of Market street, received its name in a similar manner to the preceding section, the blocks here being composed of six one hundred vara lots, arranged in a similar manner to those of the fifty vara survey.

On the 20th of June, 1855, a Commission was appointed to lay out blocks and streets west of Larkin and Ninth streets, and to extend these to the charter line of 1851. This tract is also in two divisions—the one lying north of Market and Ridley forming part of what is now known as the Western Addition, and the other lying south of the same streets and embracing portions of what are now known as the Mission and the Potrero; and, from these surveys as a base, the main subdivisions of the city now known as the Western Addition, the Mission and the Potrero, together with Horner's Addition, have been extended to their present limits, a description of which will be found in another part of this report.

In 1862, by an Act of the Legislature, approved April 26th of that year, there was appointed a Commission, consisting of the City and County Surveyor (then George C. Potter), Milo Hoadly and Thaddeus R. Brooks. This Commission was called the Board of City Engineers.

This Act was again amended, by another Act of the Legislature, approved April 4, 1864.

The greater portion of the work under these Acts was confined to the section bounded by Larkin, Market and Valencia streets on the west, Tracy or Fourteenth street and Mission Creek on the south, and the Bay of San Francisco on the east and north. Operations were, however, extended as far west as Devisadero and Castro streets, and as far south as Twenty-second street. Many irregularities appear in the blocks and street lines as laid out by this Board, but it is to be supposed that some good and sufficient reasons guided it in its work. This is, nevertheless, greatly to be regretted, as upon the work done by that Board depends the accuracy of our present surveys.

In 1868, by an order of the Board of Supervisors, approved January 14th, a Commission was appointed to lay off in blocks and streets that portion of the county lying between the charter line of 1851 and the Pacific ocean, which includes all of what is now known as the Outside Lands and a portion of the Western Addition.

The remaining portions of the city have sprung up, from time to time, as laid out, by different individuals or associations, and are in this report included under the general head of Homesteads, with the exception of that portion described as South San Francisco, which has been considered of enough importance in itself to constitute one of the main subdivisions of the city. The city may now be considered as extending over the entire county, whose area is given by the State Surveyor-General in his report of 1879-80 as 27,000 acres, or about 42.19 square miles. This area may be approximately subdivided, as shown in the following table :

TABLE OF AREAS.

NAME OF GRANT.	AREA IN ACRES.	AREA IN SQUARE MILES.
Pueblo of San Francisco..................................	12,613 44	19. 756
Other confirmed grants..................................	11,078 92	17. 311
Public Lands and United States Reservations..........	3,277 64	5. 121
County of San Francisco..........................	27,000 00	42. 188

In this estimate it is not intended to give the exact area of the City and County of San Francisco, for with the time at my disposal I have found it impossible to make the careful calculations and study of data necessary not alone for this, but also to give an accurate idea of the areas included in subdivisions, the length and area of streets, and many other minor points of useful and interesting information that should be embodied in the report of the Engineer and Surveyor of a large city. But by the end of the coming year I hope to give you these points in as exact a form as is possible.

SUBDIVISIONS.

Such information as is embodied under this head is derived from the last official map, dated 1870, since which date some changes have occurred, but none, I think, which will materially affect the matter herein contained.

The city is divided into eight districts or sections, known respectively as the Fifty-Vara Survey, the One Hundred-Vara Survey, the Western Addition, the Mission and Horner's Addition, the Potrero, Outside Lands, South San Francisco and Homesteads. These are the names generally applied to the main subdivisions, and have been retained throughout this report, the external boundaries of each being followed as nearly as circumstances would allow. I will now take up each of these subdivisions separately, giving, under the head of each, its boundaries, the principal features of its surveys, and the work performed there during the year.

THE FIFTY-VARA SURVEY.

This section of the city covers an approximate area of 1,222 acres or 1.9 square miles, and is bounded by Larkin street on the west, Market street on the south, and by the Bay of San Francisco on the north and east. This is the oldest portion of the city, the first surveys, as before stated, extending over a part of this section, and being made in 1839. The main streets here, 51 in number, are mostly laid out in two directions, at right angles to each other, seventeen having the true bearing of N. 8 deg. 45 min. W. and thirty that of N. 81 deg. 15 min. E. The exceptions to this rule are Market street and Montgomery avenue, City Hall and Park avenues; the former being the south boundary ot the district and running N. 45 deg. 29 min. 9 sec. E.; the second starting at the corner of Montgomery and Washington streets and running to an intersection with Beach, between Leavenworth and Hyde. Of the two others, which are short streets, one runs parallel and the other perpendicular to Market street. The streets here vary in width from 49 feet 1½ inches to 200 feet, as shown in the following table:

TABLE SHOWING WIDTH OF MAIN STREETS.

NAME OF STREET.		INCLUSIVE.		WIDTH.	
NORTH AND SOUTH.	EAST AND WEST.	FROM	TO	FEET.	INCHES.
Dupont N. of Bush				45	5
Dupont S. of Bush				70	
Kearny N. of Broadway				45	5
Kearny S. of Broadway				75	
Montgomery				62	5
Powell				66	9
Stockton				66	
City Hall avenue				200	
All streets		Sansome	Drumm	63	9
All streets		Mason	Larkin	68	9
	Broadway			82	6
	Cala. E. Kearny			85	
	Cala. W. Kearny			82	6
	Park avenue			80	
	All streets	Pacific	Pine	49	1½
	All streets	Jefferson	Vallejo	68	9
	All streets	Bush	Hayes	68	9
Market				120	
Montgomery avenue				80	

There are many minor streets, places, lanes and alleys which it is impossible to include in any table.

This district contains 328 blocks, exclusive of the City Hall Reservation and lots. These blocks were originally supposed to contain six 50-vara lots each, but the size of the blocks vary much, owing to causes too numerous to mention. The blocks and lots each have their distinguishing number. Among these are included nineteen blocks divided into Beach and Water Lots. In addition to these are a few blocks created by the construction of the Sea-wall. There are also four public squares or parks. The official grades of this section will be found in Table No. 3, under the heading of Tables.

THE WIDTH OF SIDEWALKS

Are in this, the same as in all the other sections of the city, governed by Order No. 1,588, Section 2, and which reads as follows:

"Every sidewalk in that portion of the city lying east of Sansome street and north of Market street shall be one-sixth of the width of the street of which it shall form a part; except where sidewalks of greater width have heretofore been ordered by the Board of Supervisors, and wholly or partially constructed.

Provided, further, that upon the petition of the owners of one-half in frontage of the lots and lands fronting on any one block in said portion of the city, the Superintendent of Public Streets, Highways and Squares may allow the sidewalks in said block to be constructed of the width and in the manner prescribed for that portion of the city west of Sansome street and north of Market street.

Also, *provided*, that all sidewalks constructed hereafter on the streets forming the water-front of this city and county shall be fifteen feet in width.

In other parts of the city the width of every sidewalk shall be as follows:

In any street less than forty feet wide, one-fifth the width of the street; except when otherwise ordered by the Board of Supervisors.

In all streets not less than forty feet and less than fifty feet wide, ten feet.

In all streets not less than fifty feet and less than sixty feet wide, thirteen feet.

In all streets not less than sixty feet and less than seventy feet wide, fifteen feet.

In all streets not less than seventy feet and less than eighty feet wide, eighteen feet.

In all streets not less than eighty feet and less than one hundred feet wide, nineteen feet.

In all streets one hundred or more feet wide, twenty-two feet.

Provided, that the sidewalks in Valencia street, between Market and Twenty-sixth streets; in Mission (except from Twenty-third to Twenty-fourth street), Howard, Folsom and Harrison streets, southwest of Ninth street; Alameda, El Dorado, Santa Clara, Mariposa, Solano, Butte and Napa streets, from Potrero avenue to Harrison street; Jersey, Hampshire, York, Florida and Columbia streets, from Napa street to Channel street, and in Sixteenth street, shall be fifteen feet wide.

In Mission street, between Twenty-third and Twenty-fourth streets, fifteen feet and six inches wide.

Every sidewalk shall be constructed to the satisfaction of the Superintendent of Public Streets and Highways, so as to have an even surface, and shall rise from the curb at the rate of one-fifth of an inch to every foot of width. All plank sidewalks shall be constructed of plank at least two inches in thickness, well spiked down to each sill.

The sills of the plank sidewalks shall be of redwood, at least three inches thick and six inches wide, and shall be placed not more than three feet apart."

WIDTHS ESTABLISHED BY SPECIAL ORDERS.

By Order No. 1,787, Bluxome street, from Fourth to Fifth streets, sidewalk 15 feet wide.

By Order No. 1,797, Bluxome street, from Fifth to Sixth streets, sidewalk 10 feet wide.

By order No. 1,813, Church street from Market to 30th, sidewalk 15 feet wide.

By Order No. 1,833, Harrison street, from Ninth to Tenth streets, sidewalk 19 feet wide.

By Order No. 1,829, Valley street, sidewalk 12 feet wide.

By Order No. 1,842, Duncan street, from Belleview to San Jose avenue, sidewalk 12 feet wide.

ONE HUNDRED–VARA SURVEY,

Is that portion of the city bounded by Market, Ninth and Channel streets and the Bay of San Francisco.

This section covers an approximate area of 991 acres, or 1.55 square miles, and is divided into 97 blocks. Of these, 54 contain six 100-vara lots each, six contain four 100-vara lots each, two are triangular blocks, and the remaining thirty-five are what are generally known as Water Lots, and properly belong to that survey. Each of these blocks is designated by a number, as is also each 100-vara lot and each Water Lot.

There are twenty-seven main streets in this section, of wich eleven run parallel and sixteen perpendicular to Market street. These are all of a uniform width of eighty-two feet six inches, except Market street, which is one hundred and twenty feet, Channel street two hundred feet, and King street seventy feet.

The blocks in this section are frequently subdivided by small streets whose width varies from thirty-five to forty feet. There is one public square in this section covering an area of 2.53 acres.

For the official grades, see Table No. 4.

For work done during the year, see Tables Nos. 1 and 2.

WESTERN ADDITION

Is that portion of the city bounded by Larkin, Market, Ridley, Waller and Stanyan streets, First avenue, the south and east lines of the Presidio Reservation, and the Bay of San Francisco.

This is quite a large subdivision, covering an area of about 2,817 acres, or 4.4 square miles, containing within its boundaries four cemeteries, nine public squares, parks and reservations, exclusive of the portion of Golden Gate Park which enters it. It is divided into 721 blocks, containing generally six 50-vara lots, and although some of these blocks are of smaller dimensions, the variation is so regular and well defined as to cause no confusion of any kind. The blocks in this district are separated by 85 main streets, running parallel to or being extensions of those in the Fifty-Vara Survey. The following table shows the widths of these streets:

TABLE SHOWING WIDTH OF MAIN STREETS.

Name of Street.		Inclusive.		Width.	
NORTH AND SOUTH.	EAST AND WEST.	FROM	TO	FEET.	INCHES.
Baker		Turk	South	100	
Baker		Turk	North	68	9
Devisadero				100	
First avenue				100	
Masonic avenue				100	
Parker avenue				100	
Van Ness avenue				125	
	Broadway			82	6
	California			82	6
	Lewis			150	
	All streets	Tonquin	Vallejo	68	9
	All streets	Pacific avenue	Sacramento	68	9
	All streets	Pine	Ridley	68	9

The grades for this section are shown in Table No. 5, under the heading of Tables.

For work performed during the year, see Tables 1 and 2.

MISSION AND HORNER'S ADDITION.

This section is bounded by Ninth, Market and Channel streets, Charter line of 1851, San Miguel Ranch line, Douglas, Elizabeth, Belleview and

Thirtieth streets, San Jose avenue, Army street and Potrero avenue, and Twenty-first, Harrison and Channel streets.

This subdivision covers an approximate area of 1,926 acres, or about three square miles. There are in this section 340 blocks, greatly varying in size, but uniform and regular in their respective districts, all being either 560 by 520, or this area divided into two or four equal parts. There are here sixty-nine main streets, or streets which divide the district into blocks of 560 by 520 feet. In addition to these sixty-nine streets, many of the blocks are subdivided by other streets. The widths of the street are shown in the following table:

TABLE SHOWING WIDTH OF STREETS.

NAME OF STREETS.		INCLUSIVE.		WIDTH.	
NORTH AND SOUTH.	EAST AND WEST.	FROM	TO	FEET.	INCHES.
Bellevue, Collingw'd, Douglass, Ellen, Eureka				60	
Dolores				120	
Market				120	
Diamond				64	
All other main streets				82	6
Intermediate streets				60	
	Ridley			80	
	10th, 11th, 12th, 16th			80	
	13th			50	
	Herman			78	9
	All other streets			64	

In this section are two cemeteries of 6.68 acres each, and one public square covering 2.86 acres.

For the grades in this section, see Table No. 6.

For work performed during the year, see Tables Nos. 1 and 2.

POTRERO

Is that portion of the city bounded by Channel, Harrison and Napa streets, Potrero avenue, the east boundary line of the Rancho Rincon De Las Salinas, Islais Creek channel, Honduras street and the Bay of San Francisco.

This section of the city is divided into 494 blocks, which are separated by 74 main streets, and covers an approximate area of about 1,639 acres, or about 2.56 square miles. In this section there are four public squares and servations. All the streets in this section are eighty feet wide except

Potrero avenue, which is one hundred feet, and the water-front streets. All the streets running east and west are 66 feet wide, except Centre street, which is eighty feet.

The grades in this section will be found in Table No. 7.

The work performed during the year in Tables Nos. 1 and 2.

OUTSIDE LANDS.

Under this head is included all that territory bounded by the Pacific ocean on the west, First avenue and the San Miguel Rancho on the east, the Presidio Reservation on the north, and the Rancho De La Merced on the south.

This section is composed of 939 blocks, the general size of which is 240 feet east and west by 600 feet north and south. There are four public squares and parks, including Golden Gate Park, and one cemetery. The above blocks are separated by seventy-three main streets; those running north and south are called avenues, and are seventy feet in width, except First avenue, which is one hundred feet wide. The streets running east and west are eighty feet in width, except Point Lobos avenue, which is one hundred and twenty five feet wide.

The grades for this section will be found in Table No. 8.

The work performed is shown in Tables Nos. 1 and 2.

SOUTH SAN FRANCISCO.

This subdivision is the extreme southeast corner of the city and county of San Francisco, and is bounded by Islais Creek channel, the easterly lines of the Rancho Rincon De Las Salinas, the Visitacion Ranch and the Bay of San Francisco.

The subdivision contains 734 blocks, the size of each being 600 feet by 200 feet. These are separated by one hundred-and-three streets. Those running northwest and southeast were formerly called avenues, but are now streets, and are all 80 feet wide except Honduras street and those along the water-front, which are 150 feet wide. Those running northeast and southwest are 64 feet wide, except along the water-front.

The grades of this district will be found in Table No. 9.

The work performed during the year will be shown in Tables Nos. 1 and 2.

HOMESTEADS.

The term Homesteads includes all such lands in the city and county as is not embraced within the boundaries of the above named subdivisions, with the exception of the Government Reservation. Most of these tracts have from time to time been laid off by individuals or associations into blocks and streets, and the streets deeded to the city.

These lands lay generally within the boundaries of the four large Ranchos which constitute such a great portion of our city and county, and known respectively as the Rancho Laguna De La Merced, San Miguel Rancho,

Rancho Rincon De Las Salinas, and the Rancho Canada De Guadalupe Rodeo-Viejo Y Visitacion.

It is impossible to give any idea of the number of blocks and streets in this class, or the width of streets, and few, if any, of the grades have been established. Surveys in most of these tracts are difficult, if not entirely impracticable, owing to the scarcity of data and the uncertainty as to the true position of streets. Consequently, little work has been done in them.

The grades for these sections will be found in table No. 10.

DISADVANTAGES OF PRESENT LAWS GOVERNING THE WORK OF THE OFFICE.

Under our present law, work done upon public streets is to be done to the satisfaction of the Superintendent of Streets, and it remains in his power to grant or refuse permission to any party or parties wishing to prosecute any special work. The law further requires that all street work when completed, and before acceptance by the city, shall be to the official grade and line of said street, and provides that in proof thereof a certificate from the City and County Surveyor shall be obtained.

To this provision our present Superintendent of Streets has, I believe, strictly adhered; but, under former administratioas, I understand it was a frequent custom to receive the certificate of some engineer sometimes engaged by the contractor, and often on the simple oath of the inspector, that the work had been done as per contract. And it is still the custom in cases of grading for the estimates to be made by outside parties, thereby depriving the property owners of the protection that an estimate from this office would afford them. But this, I believe, the law is powerless to prevent, and it remains, therefore, in the hands of said property owners themselves to accept such estimates or not. The practice of accepting work not certified to by this office has lead to a great deal of bad work, and many inequalities in the lines and grades of our streets. These defects with the assistance of our present Superintendent of Streets, I hope to prevent in any work carried through during our term of office.

Another mistake which appears to me to have been made, is the law governing the grades of our streets. As I understand, a grade once established can only be changed upon the application of two-thirds of the property owners in the block affected by such proposed change. This should not be the case, as no property owner or number of property owners should be allowed under any consideration to change any grade unless with the full approval of the City and County Surveyor, and after he has fully investigated the cause of their reasons for wishing such change, for it is to be supposed that a careful study of the surrrounding districts had been made by the Surveyor before he recommended the establishment of any grade; and he alone should have the power to change it, especially as any change therein might cause an irremediable defect in the operation of the sewers, or other work, not only in the immediate vicinity, but for a long distance off.

REQUIREMENTS OF THE OFFICE.

There are many improvements that could be made to the advantage both of this office and the general public. In fact these improvements appear so extensive that I hesitated before presenting them fully to your notice, knowing full well that it would take some little consideration and examination into facts on your part before you could fully understand their necessity. Yet as time went on, and the necessity for these improvements became more apparent, I determined to call your attention to them. This I did, first in my estimate of expenses for the coming year, which I sent in to your Auditor, and afterwards by a copy of this estimate placed before your Committee on Finance when the tax levy was under consideration. I regret to say that no provision was made for these improvements. However, I would again call your attention to the matter, and herewith give a list of the needed improvements in the order of their importance:

The connection of many of our outlying districts with the present official surveys.

To understand the full importance of having this done, and done soon, you must remember that all private and public property is greatly dependent upon the correctness of the work done by this office, and that many tracts of land laid off by private surveys will not agree upon the ground with the recorded maps. In such sections we have frequent call for surveys. These orders we either have to flatly refuse to accept or charge such an exorbitant price that it is equivalent to a refusal, for in such instances the only way to accomplish the end in view is to resurvey the entire tract, and for this no *one* owner cares to pay. Whereas, if the the streets were all laid out and well defined by permanent marks, no such trouble would exist.

I find that the official elevations which we have at our command are, in many instances, unreliable, and often scattered. This is not to be wondered at when one considers that about twenty years have elapsed since any line of consecutive levels has been run up from the city base, and, of necessity, many errors have crept in, and many of the old original points disappeared.

This, too, should receive your immediate attention, more especially if any extended system of improvements is under contemplation.

Then, we have much data accumulated in this office during many years. This I would very much like to see tabled and catalogued and in condition for easy reference before the expiration of my term; but it is impossible to do even this without your assistance.

I should also like to call your attention to the fact that the latest Official Map bears the date of 1870. It is unnecessary to say anything on this subject, as the growth of the city since that date is so obvious that the necessity for a new map is evident to all.

At least one of our present block-books is sadly in need of renewal. This book covers that portion of the city lying east of Larkin and Ninth streets, and is very much mutilated by daily use and handling. It was made under a resolution passed January 30, 1866, and having been in constant use since that time, is in a very bad condition.

The city should also purchase a new transit and level, as those in present use are very much worn.

In conclusion I will state that in submitting a report varying so much from the usual custom of this office, my object is to embody many useful and interesting facts in such a form as to be easily accessible to the general public. Whilst this has not been done as thorougly as I could wish, still it is as complete as the time alloted would allow.

Very respectfully,

S. HARRISON SMITH,

City and County Surveyor.

APPENDIX

TO THE

REPORT OF THE CITY AND COUNTY SURVEYOR.

LIST OF MAPS OF RECORD

IN THE OFFICE OF CITY AND COUNTY SURVEYOR JULY 1, 188 .

Plan of the Town of Yerba Buena extended from the Original, September 1, 1846.

Copy of above.

Map of the Beach and Water Lots of San Francisco, A. D., 1847.

Plan of San Francisco, copied from the Original, W. N. Leavenworth, First Alcalde, District, San Francisco.

Official Map of San Francisco, compiled from the Field Notes of the Re-survey made by William M. Eddy, C. E., Surveyor of the Town of San Francisco.

Official Map of San Francisco, compiled from the Field Notes of the Official Re-survey, with all the extensions ordered by the Ayuntamiento, made by William M. Eddy, C. E., Surveyor of San Francisco, 1850.

"Official Map of the City and County of San Francisco, full and complete to the present date. January 15, 1851 (lithographs)."

"We certify that this Map has the boundary line of the Beach and Water property described in Section One of 'An Act to provide for the disposition of certain property of the State of California, approved March 26, 1851, and is duly marked in red. Done in accordance with the fifth section of said Act."

Witness our hands and the PRIVATE SEAL of the Mayor (there being no corporate seal), this 4th day of April, 1851.

JOHN W. GEARY,
Mayor of San Francisco. [SEAL.]

WM. M. EDDY,
City and County Surveyor. [SEAL.]

Copy of above, with certificate of J. J. Gardiner, City and County Surveyor, January 18, 1855, and certificate of Thos. Hayes, County Clerk, February 9, 1855.

Official Map of San Francisco, W. P. Humphrey's, 1853.

Topographical and complete Map of San Francisco (lithographed), with proposed Front Extension. Respectfully dedicated to the Citizens of San Francisco by William M. Eddy, County Surveyor. 1853.

Map of Horner's Addition, City of San Francisco, surveyed for John M. Horner by J. J. Gardiner, City and County Surveyor. San Francisco, January 1, 1854.

Official Map of the County of San Francisco, from actual surveys by J. J. Gardiner, County Surveyor. Completed September, 1855.

Map of Water Lot Property. December 5, 1854.

City of San Francisco (Van Ness Map). For the location and dimensions of the streets to be laid out within the city limits west of Larkin and southwest of Johnston streets, with the lots or grounds selected and set apart for the several public uses as hereon designated, made, selected and presented for the approval of the Common Council, by the undersigned City Surveyor and Commissioners, under and in pursuance of the provisious of an Ordinance of the Common Council of the City of San Francisco, entitled "An Ordinauce for the settlement and quieting of land titles in the City of San Francisco," approved June 20, 1855; and also an Ordinance of the said Common Council entitled "Ordinance providing for selecting and designating public squares and reservations for Hospital, Fire Engine and School Houses, and other public purposes, and for adopting the plan of the streets in the western and southwestern portion of the city according to the provisions of Ordinance No. 822, and confirmatory of said Ordinance No. 822." Approved September 27, 1855.

JOHN J. HOFF,
City Surveyor,
C. H. GOUGH,
MICHAEL HAYES,
HORACE HAWES,
Commissioners.

Official Map of the Mission Dolores.

Map of San Francisco. Jasper O'Farrell. (Dilapidated).

Map showing roads across Market street, with streets on curve from Prince to Corbett street. (Dilapidated).

Official Map of San Fraucisco, west to Larkin street and south to South street.

Map of Grade of the City of San Francisco, established as per Order No. 684.

GEO. C. POTTER,
City and County Surveyor,
T. R. BROOKS,
} Board of City Engineers.

June 30, 1866. (Needs renewal).

Location Map A.

Official Map of the City Grade. 1853.

MILO HOADLEY,
WM. P. HUMPHREYS,
Engineers of Grades.

Sewer Map of the City and County of San Francisco, as per Resolution No. 8,080 of the Board of Supervisors, showing existing sewers, also proposed sewers as recommended for that portion of the City and County where the grades have been established. Prepared by William P. Humphrey, City and County Surveyor. (Needs renewal.)

Map of the Outside Lands of the City and County of San Francisco, as per Ordinances 733 and 800 of the Board of Supervisors. Approved October 12, 1866, and January 14, 1868.

Copy of the above.

Map of Official Grade of the City and County of San Francisco. (Very dilapidated).

Map of Yerba Buena Park, Park Avenue and City Hall Avenue, showing subdivisions of property sold by Act of Legislature. Approved April 4, 1870.

WM. P. HUMPHREYS,
City and County Surveyor.
P. H. CANAVAN,
J. G. EASTLAND,
CHAS. E. McLANE,
Commissioners.

Official Map of the City and County of San Francisco, prepared by Wm. P. Humphreys, City and County Surveyor, as per Order 966 of the Board of Supervisors. 1870. Approved October 25, 1870.

Map of Monuments, as located by the Board of Engineers. 1864.

GEO. C. POTTER,
City and County Surveyor.

THADDEUS R. BROOKS,
Board of City Engineers.

Map of the City Front and Water Lot Property of the City of San Francisco, as defined by the Acts of Legislature passed April 24, 1863, and March 4, 1864, made by direction of the Harbor Commissioners. Surveyed by G. C. Potter and T. R. Brooks.

I hereby certify that this map is an accurate plat of surveys showing the location and lines of the streets along the water front of the city of San Francisco, as the same are extended, established and defined by Section 8 of an Act of the Legislature of the State of California, approved March 6, 1864, and that the said map was filed in the office of the Surveyor of said city by the Board of State Harbor Commissioners on the 25th day of May, 1864.

GEO. C. POTTER,
City and County Surveyor.

Map inside Larkin and Ninth streets, showing wharves.

Map showing proposed extension of Army street to the San Bruno Road. Adopted by Board of Supervisors June 25, 1878.

Maps of Army Street Extension Nos. 1, 2, 3, 4.

Plan of Army Street Sewer No. 2. Filed September 8, 1879.

Army Street Sewer, Nos. 12 and 13. Filed September 8, 1879.

Three maps (small) Army Street Sewer.

Map of Army Street Extension.

Cross Sections of Proposed Sewers in Army Street Extension. Filed January 9, 1880.

Diagram showing the extension of Capp street, Howard street, Treat avenue and Serpentine avenue to Army street. Filed August 21.

Plan of Bulkhead, Army street.

Profile Center Line of Army Street Extension, 1878, Nos. 1 and 2.

Profile of Guerrero Street, Army Street Extension West. Filed March 6, 1882.

Profile of Twenty-seventh Street, Army Street Extension West. Filed March 6, 1882.

The other public property in the office consists of Block Books, Field Note Books, Profiles, and numerous maps and diagrams which it has been impossible to classify in the limited time at my disposal. There are also the following instruments:

1 Transit (in fair condition).

1 Transit (entirely unfit for use).

1 Level.

1 Level Rod (unfit for use).

TABLES.

Nos. 1 and 2.—Work performed during the year ending June 30th, 1887.

Nos. 3, 4, 5, 6, 7, 8, 9, 10 and 11, show established grades of the City and County of San Francisco.

The grades of streets herewith presented comprise all the official grades established up to date, and are computed in feet from the base or zero, which is six feet and seven-tenths above an ordinary high-tide mark. The original mark being on a pile at the boat-stairs at the corner of Pacific and Davis streets. The top of the wharf at that point is one foot and one-tenth above the base, or seven feet and eight-tenths above ordinary high tide.

No. 1.

Table of Surveys Made from July 1st, 1886 to June 30th, 1887.

SUBDIVISIONS.	SURVEYS MADE.		TOTAL NO. OF SURVEYS.
	From July 1st, 1866, to Jan. 3d, 1887.	From Jan. 3d, 1887, to June 30th, 1887.	For Year ending June 30, 1887.
Fifty-vara Survey	68	48	116
One hundred-vara Survey	48	28	76
Mission and Horner's Addition	89	95	184
Western Addition	124	106	230
Potrero	4	5	9
South San Francisco	2	1	3
Outside Lands	10	4	14
Homesteads	2	8	10
Total	347	295	642

TABLE No. 2.

SHOWING TOTAL AMOUNT OF STREET WORK ON WHICH CERTIFICATES HAVE BEEN ISSUED BY THIS OFFICE FROM JULY 1st, 1886 TO JUNE 30th, 1887.

Certificate	Location.	Grading.	Macadim	Curbs.		Paving.	Sewers.		Corners.
Number.	Name of Subdivision.	Lineal ft.	Lineal ft.	Stone. Lineal ft.	Wood. Lineal ft.	Sq. ft.	Brick. Lineal ft.	I. S. Pipe Lineal ft.	No. of
10	Fifty-vara Survey	....	....	3,850	....	86,796	....	413	12
3	One hundred-vara Survey	....	....	1,650	....	17,325	165	550	4
55	Mission and Horner's Addition	560	252,253	245	14,998	26,529	3,584	8,585	42
32	Western Addition	....	18,356	7,487	825	158,542	697	7,014	20
	Potrero	7,640	....	......	....	....	....	....	....
....	South San Francisco	....	....	....	....	....	....	....	....
....	Outside Lands	....	....	....	....	....	....	....	....
2	Homesteads	....	....	....	....	....	396	....	2
103		8,200	270,609	13,232	15,823	289,192	4,842	16,562	80

TABLE

SHOWING OFFICIAL GRADES

STREET NAMES.	Market	Hayes	Grove	Fulton	McAllister	G'ld'n Gate av.	Turk	Eddy	Ellis	O'Farrell	Geary	Post	Sutter	Bush	Pine
East	....	....	....	....	....	....	....	....	....	....	......	......	......	.....	......
Drumm	....	....	....	....	....	....	....	....	....	....	......	......	......	.....	......
Davis	....	....	....	....	....	....	....	....	....	....	......	......	......	.....	1.25
Front	....	....	....	....	....	....	....	....	....	....	......	......	......	.....	2.5
Battery	....	....	....	....	....	....	....	....	....	....	......	......	......	5	4
Sansome	....	....	....	....	....	....	....	....	....	....	......	......	13	13	5.5
Montgomery	....	....	....	....	....	....	....	....	....	....	......	24	24	20	13
Kearny	....	....	....	....	....	....	....	....	....	....	35	39	39	39	39
Dupont	....	....	....	....	....	....	....	....	....	32.8	40.22	45.49	51.2	65	94
Stockton	....	....	....	....	....	....	....	....	30	40	50	62	78	110	159
Powell	....	....	....	....	....	....	....	25	30	44	58	74	92	135	182
Mason	....	....	....	....	....	...	29	30	45	60	70	82	115	156	214
Taylor	...	....	....	....	....	34	33	35	50	65	80	105	135	171	213
Jones	....	....	....	....	33	48	38	40	60	80	95	128	156	191	232
Leavenworth	....	....	....	....	37	59	50	55	70	100	120	150	180	210	240
Hyde	....	....	....	....	43	56	60	65	75	95	110	130	160	195	205
Larkin	44	48	50	50	49	61	65	80	85	100	105	115	130	154	160

No. 3.

OF THE FIFTY-VARA SURVEY.

California......	Sacramento...	Clay	Washington ...	Jackson	Pacific.........	Broadway......	Vallejo	Green	Union	Filbert	Greenwich......	Lombard ...	Chestnut	Francisco......	Bay.............	North Point...	Beach..........	Jefferson	Tonquin.........
......	0	0	0	0															
0	0	0	0	0	0														
0	0	0	0	0	0	0	0												
1.5	0.75	0	0	0	3	3	3	0	0	0	0								
3.16	2.5	1.75	1.75	1.75	4	12	10	7.5	5	2.5	0	0							
5	4.25	3.5	3.5	3.5	12	35	28	21	14	8	4	0	0						
7.5	6.75	6	6	6	30	70	115	170	220	180	136	12	0	0					
35	28	28	28	20	30	60	142	152	147	209	231	176	12	0	0	0			
86	68	73	64	51	48	60	83	95	102	110	153	144	110	50	10	0	0		
161	128	118	102	93	82	84	86	82	70	80	95	90	60	27	8	2	0		
228	205	180	152	133	115	110	104	87	70	57	37	30	10	5	4	2	0	0	
275	276	220	182	173	165	132	154	152	104	73	40	20	8	5	4	2	0	0	
278	280	268	252	238	215	220	280	218	154	95	55	22	18	6	3	2	0	0	
300	338	335	332	294	257	297	296	282	210	130	95	75	73	40	10	5	2.5	0	
260	290	320	305	275	245	230	244	295	266	205	182	162	136	90	58	25	5	0	
210	240	270	255	235	215	190	215	226	250	280	286	270	220	140	90	57	24	0	
180	200	220	210	196	182	155	169	190	220	228	236	233	215	138	91	58	25	0	0

SUPPLEMENT TO TABLE No. 3.

STREETS.	FEET.
MONTGOMERY AVENUE—E. LINE:	
Montgomery, W. line	6
Jackson, S. line	11.62
Jackson, N. line	13.2
Kearny, E. line	23.99
Kearny, W. line	32.53
Broadway, S. line	57.50
Broadway, N. line	60
Dupont, E. line	68.50
Dupont, W. line	72
Vallejo, S. line	79
Vallejo, N. line	80
Green, S. line	89.42
Stockton, W. line	79.62
Union, S. line	70
Union, N. line	70
Powell, E. line	60.26
Filbert, N. line	57
Greenwich, S. line	39.1
Greenwich, N. line	39.43
Mason, E. line	34.50
Mason, W. line	30
Lombard, S. line	16.52
Lombard, N. line	16.52
Chestnut, S. line	16.97
Taylor, W. line	15.20
Francisco, S. line	16.62
Francisco, N. line	16.62
Jones, E. line	15.60
Bay, S. line	15.70
Bay, N. line	15.70
North Point, S. line	13.53
North Point, N. line	13.53
Leavenworth, E. line	13
Leavenworth, W. line	13
Beach, S. line	12

STREETS.	FEET.
MONTGOMERY AVE.—CENTRE LINE:	
Washington	6
Jackson	14.80
Kearny	28.35
Pacific	32.23
Broadway	60
Dupont	66.55
Vallejo	81
Stockton	82
Green	82
Union	70
Powell	57
Filbert	57
Greenwich	39.60
Mason	34.67
Lombard	15.97
Chestnut	18
Francisco	16.62
Jones	15.60
Bay	15.70
North Point	13.53
Leavenworth	13
Beach	12
MONTGOMERY AVENUE—W. LINE:	
Washington, N. line	8.18
Jackson, S. line	15.16
Jackson, N. line	16.55
Kearny, E. line	24.44
Kearny, W. line	29.19
Pacific, S. line	33.60
Pacific, N. line	35.41
Broadway, S. line	59
Dupont, W. line	65.20
Vallejo, S. line	81
Vallejo, N. line	81
Stockton, E. line	83.17

SUPPLEMENT TO TABLE No. 3—CONTINUED.

STREETS.	FEET.
MONTGOMERY AVENUE—W. LINE: (Continued.)	
Green, N. line	82.71
Union, S. line	70
Union, N. line	70
Powell, E. line	66.17
Powell, W. line	62.36
Filbert, S. line	57
Filbert, N. line	57
Greenwich, S. line	39.77
Mason, W. line	34.84
Lombard S. line	16.52
Lombard, N. line	17.95
MONTGOMERY AVENUE—W. LINE: (Continued.)	
Taylor, E. line	19.9
Chestnut, N. line	24.84
Francisoo, S. line	16.62
Francisco, N. line	16.62
Jones, E. line	15.60
Jones, W. line	15.60
Bay, S. line	15.70
Bay, N. line	15.70
North oint, S. line	13.53
Leavenworth, W. line	13
Beach, S. line	12

TABLE

SHOWING OFFICIAL GRADES

STREET NAMES.	East..........	Steuart	Spear..........	Main..........	Beale	Freemont..	First..........	Second..........	Third..........	Ritch..........	Fourth..........	Fifth..........
Market	0	0	0	0	1.25	3	5	20	35	.....	30	24
Mission.................	0	0	0	0	1.25	3	5	11	17	......	24	18
Howard.................	0	0	0	0	2	4	8	14	20	....	20	12
Folsom.............. ..	0	0	0	5	10	20	30	42	15	13.4	6	4
Harrison................	0	0	2	20	15	60	80	50	13	11.4	4	0
Bryant.................	......	......	0	1	5	20	30	45	6	......	2	0
Brannan................	......	......	......	......	0	2	2	27	12	......	0	0
Townsend	......	......	......	......	......	......	0	10	11	......	0	0
King...................	......	......	......	......	......	......	......	0	5	......	0	0
Berry...................	......	......	......	......	......	......	......	0	1	......	0	0
Channel	......	......	......	......	......	......	......	......	0	......	0	0

No. 4.

OF THE 100-VARA SURVEY.

Sixth.........	Seventh.........	Eighth.........	Ninth.........	Tenth.........	Eleventh.........	Potter	Brady.........	Valencia,.........	Guerrero.........	Dolores, E. L...	Church and 14th..	Sanchez.........	Noe.........	C ....
34	32	43	48	48	42	42	42	42	88	110	86	116	126	138
30	29	33	42	......	......	......	......	......	......	......	......	......	......	......
10	15	20	35	......	......	......	......	......	......	......	......	......	......	......
5	6	15	25	......	......	......	......	......	......	......	......	......	......	......
2	5	12	15	......	......	......	......	......	......	......	......	......	......	......
0	9	9	9	......	......	......	......	......	......	......	......	......	......	......
0	6.75	0	6	......	......	......	......	......	......	......	......	......	......	......
0	3	0	......	......	......	......	......	......	......	......	......	......	......	......
0	2	......	......	......	......	......	......	......	......	......	......	......	......	......
0	1	......	......	......	......	......	......	......	......	......	......	......	......	......
0	0	......	......	......	......	......	......	......	......	......	......	......	......	......

SUPPLEMENTAL TABLE.

Tehama and First	15.40
Ritch and Harrison	11.40
Ritch and Folsom	13.40
De Boom and Second	27.81

TABLE

SHOWING OFFICIAL GRADES

STREET NAMES.	Ridley	Hermann	Waller	Haight	Page	Oak	Fell	Hayes	Grove	Fulton	McAllister	Golden Gate av	Turk	Eddy	Ellis	O'Farrell	Geary
Larkin	....	....	....	....	....	....	....	48	50	50	49	61	65	80	85	100	105
Polk	....	....	....	....	....	....	44	46	48	50	54	65	70	86	90	110	115
Van Ness	....	....	....	....	....	44	46	48	50	54	58	69	76	100	116	130	140
Franklin	....	....	....	....	43	47	49	51	54	57	62	76	90	120	150	170	170
Gough	....	....	....	45	47	50	52	55	58	61	66	79	94	130	173	196	198
Octavia	..	N. E. 56 NW. 59 SW. 59.5		80	60	54	57	60	63	67	70	81	102	130	168	200	200
Laguna	....	90	93	120	108	85	69	66	70	74	77	84	94	112	132	154	166
Buchanan	....	148	146	170	155	130	108	92	87	84	81	87	90	104	112	125	132
Webster	....	130	130	160	185	175	154	124	100	92	88	93	96	99	103	117	123
Fillmore	....	119	125	148	180	200	195	169	140	108	105	102	99	102	108	114	117
Steiner	....	122	128	144	170	210	240	215	190	150	135	112	102	106	114	122	122
Pierce	....	....	135	140	155	180	220	260	....	186	174	146	118	115	118	129	...
Scott	Park Road,	....	163	152	160	165	170	200	210	220	188	151^5	145	138	130	132	129
Devisadero		....	220	190	180	172	176	181	186	190	206	192	178	163	155	150	136
Broderick		....	280	241	230	194	187	196	200	196	234	242	228	E. 225 W. 228	205	180	162
Baker	....	....	....	270	240	202	199	200	204	200	220	245	276	....	....	....	192
Lyon	270	....	....	270	250	208	205	216	212	208	215	245	310	....	....	....	230
Central avenue	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	248
Lott	....	....	310	264	246	215	212	212	216	212	215	240	290	....	....	....	...
Walnut	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Laurel	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Locust	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Spruce	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Maple	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Cherry	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	...
Josephine	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	266

No. 5.

OF THE WESTERN ADDITION.

Post	S. line Laurel Hill Cemet'y.	Sutter	Bush	Pine	California	Sacramento	Clay	Washington	Jackson	Pacific avenue.	Broadway	Vallejo	Green	Union	Filbert	Greenwich	Lombard	Chestnut	Francisco	Bay	North Point	Beach	Jefferson	Tonquin	Louis
115	....	130	154	160	180	200	220	210	196	182	155	169	190	220	223	236	233	215	138	91	58	25	0	0	..
120	....	134	145	152	160	170	175	180	177	160	140	136	134	132	136	140	140	95	95	80	50	6	4	1	1
150	....	162	170	180	180	180	190	190	180	166	140	120	90	80	87	90	80	75	70	75	52	12	6	3	1
180	....	188	191	198	220	225	227	225	215	185	154	114	74	60	54	52	50	55	60	65	70	78	94	30	1
200	....	220	220	240	270	280	290	295	240	200	158	130	93	80	46	42	39	42	54	50	58	60	80	60	1
200	...	220	220	240	280	320	....	334	280	220	174	130	109	80	60	42	36	34	32	45	28	26	16	3	1
168	....	180	191	214	260	296	335	320	234	240	184	130	96	70	44	36	33	29	25	30	17	12	6	3	1
143	....	152	172	210	250	273	285	270	268	250	220	160	100	60	44	36	33	25	....	15	12	9	6	3	1
126	....	132	168	200	210	220	235	238	243	256	246	174	114	66	44	33	30	25	18	15	12	9	6	3	1
120	....	126	148	160	164	184	194	214	235	242	236	170	100	60	37	27	24	21	18	15	12	9	6	3	1
122	....	128	134	139	156	174	190	220	235	222	170	110	76	44	34	27	24	21	18	15	12	9	6	3	1
124	....	130	133	135	154	182	216	....	276	225	170	118	89.67	75	58	30	12	9	18	15	12	9	6	3	1
127	....	133	137	139	158	190	210	250	290	266	240	210	180	132	82	36	12	9	18	15	12	9	6	3	1
130	....	136	141	147	162	180	210	246	272	320	320	260	210	150	100	50	24	21	18	15	12	9	6	3	1
143	...	141	157	160	170	184	214	243	272	330	294	198	150	130	104	60	30	21	18	15	12	9	6	3	1
170	....	165	175	170	190	214	240	264	292	340	314	216	146	88	60	45	30	21	18	15	12	9	6	3	1
															Line U. S. Resv'n.										
202	....	199	202	202	217	238	266	298	330	370	326	260	130	128	94	60	48	36	....	..	..	..	..	..	..
244	....	242	238	242	244	260	288	314	312	300	....	....	....	....	....	....	....	....	....	..	..	..	..	..	..
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	..	..	..	..	..
....	....	....	....	....	260	276	304	284	252	230	....	....	....	....	....	....	....	....	....	..	..	..	..	..	..
....	....	....	....	....	264	230	238	250	218	188	....	....	....	....	....	....	....	....	....	..	..	..	..	..	..
....	....	....	....	....	254	270	278	248	215	....	....	....	....	....	....	....	....	....	....	..	..	..	..	..	..
....	....	....	....	....	233	256	280	275	220	...	....	....	....	....	....	....	....	....	....	..	..	..	..	..	..
....	....	....	....	....	225	252	234	232	244	....	....	....	....	....	....	....	....	....	....	..	..	..	..	..	..
....	....	....	....	....	214	246	266	274	280	....	....	....	....	....	....	....	....	....	....	..	..	..	..	..	..
..	236	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	..	..	..	..	..

TABLE No. 5

STREET NAMES.	San Miguel line	Grattan.......	Sullivan.......	Carl..........	Frederick.....	Bulah.........	Waller.........	Haight	Page	Oak............	Fell...........	Hayes.........
Josephine................................	....	....	....	....	....	....	....	....	....	....	....	....
Eugenia	....	....	....	....	....	....	....	....	....	....	....	....
Wood	....	....	....	....	....	....	....	....	....	..	....	....
Collins	....	....	....	....	....	....	....	....	....	....	....	....
Blake..	....	....	....	...	....	....	....	....	....	....	....	....
Cook..	....	....	....	..	....	....	....	....	....	....	....	....
Boyce..	....	....	....	...	....	....	....	....	....	....	....	....
Williamson	....	....	....	....	....	....	....	....	....	....	....	....
Chase..	....	....	....	....	....	....	....	....	....	....	....	....
Merrifield..................................	....	....	....	....	....	....	....	....	....	....	....	....
Mears	....	....	....	..	....	....	....	....	....	....	....	....
Masonic Avenue..............................	....	....	....	....	355	....	287	261	240	222	219	230
Ashbury	412	....	....	....	356	....	280	258	244	228	227	248
Clayton....................................	344	....	....	325	345	....	274	261	248	233	230	238
Coale..	....	....	....	290	275	....	264	258	252	238	234	248
Shrader....................................	....	....	....	....	....	....	260	270	256	242	238	254
Stanyan	....	350	325	300	268	262	259	255	252	245	241	265
Willard....................................	....	390	360	314	270							
First Avenue..............................	....	....	....	310	280	....	....	...	....	....	....	....
Park Avenue..............................	....	....	....	....	....	....	....	....	....	....	....	....
Parker Avenue	....	....	....	....	....	....	....	....	....	....	....	....

SUPPLEMENTAL TABLE.

Alemany Avenue and Geary...............	172
Alemany Avenue and O'Farrell	200
Alemany Avenue and Ellis..	225
Alemany Avenue and Eddy..	250
Alemany Avenue and Turk......................	244

—Continued.

Grove	Fulton	McAllister	Golden Gate av	Turk	Juniper	St. Rose	Eddy	Ellis	O'Farrell	Geary	Post	S line Laurel Hill Cemet'y.	Sutter	Bush	Pine	California	Sacramento	Clay	Washington	Jackson
....	....	....	....	......	....	....	....	....	....	266	....	286								
....	....	....	....	....	....	....	....	....	....	260	....	300								
....	....	....	....	292	294	261	....	....	....	250	....	300								
....	....	....	....	......	....	....	....	....	....	240.5	...	276								
....	....	....	....	....	....	....	....	....	....	225	....	240								
....	....	....	....	......	....	....	....	....	....	216	....	219								
....	....	....	....	326.5	....	....	....	....	....	212	....	220								
....	...	....	....	......	....	....	...	....	....	208	....	212								
....	....	....	....	......	....	....	....	....	....	204	....	204								
....	....	....	....	......	....	....	....	....	....	200	....	196								
....	....	....	....	......	....	....	....	....	....	196	....	180								
224	216	241	255	280	282	268	....	....	....	262										
254	238																			
260	286																			
268	316																			
291	336																			
290	306																			
....	236	....	....	205	....	....	....	....	....	192	....	....	....	....	....	190	208	216	230	270
....	....	....	....	306	....	....	....	...	....	208										
....	336	....	....	306	....	....	....	....	....	208										

SUPPLEMENTAL TABLE.

Minnie and Waller	278
Minnie and Frederick	352
Park Road (beginning at Haight and Baker streets), and Haight	286

TABLE

SHOWING OFFICIAL GRADES OF THE

STREET NAMES.	Channel	10th	11th	Potter	12th	Hermann	13th	Ridley	14th	15th	16th	17th	18th	19th	20th	Liberty	21st	22d
Hattie	....	....	....	....	....	....	....	....	....	....	....	......	196	....	......	....	......	......
Ocean Road	....	....	....	....	....	....	....	....	....	....	....	......	....	....	......	....	......	......
High	....	....	....	....	....	....	....	....	....	....	....	......	....	....	......	....	......	......
Bellevue	....	....	....	....	....	....	....	....	....	....	....	......	....	....	......	....	......	......
Fountain	....	....	....	....	....	....	....	....	....	....	....	......	....	....	......	....	......	......
Ellen	....	....	....	....	....	....	....	....	....	....	....	......	....	....	......	....	......	......
Homestead	....	....	....	....	....	....	....	....	....	....	....	......	....	....	......	....	......	......
Clara Avenue	....	....	....	....	....	....	....	....	....	....	....	......	176	....	......	....	......	......
Douglas	....	....	....	....	....	....	....	....	....	....	....	198	164	212	282	....	332	300
Eureka	....	....	....	....	....	....	....	....	....	....	317	178	150	183	237	....	302	282
Diamond	....	....	....	....	....	....	....	....	....	....	....	174	137	155	220	....	334	320
Collingswood	....	....	....	....	....	....	....	....	....	....	....	160	122	142	230	....	E. 310 W.314	E. 363 W.370
Castro	....	....	....	....	....	....	....	214	227	184	190	N. 138 S. 159	109	130	N. 186 S. 183	....	N. 270 S. 272	313
Noe	....	....	....	....	....	....	....	155	148	137	126	114	84	160	240	....	340	290
Sanchez	....	....	....	....	....	....	....	116	105	116	103	84	65	170	240	....	340	290
Vicksburg	....	....	....	....	....	....	....	....	....	....	....	......	....	....	......	....	300	250
Church	....	....	....	....	....	121	....	104	86	84	82	77	45	120	130	....	226	170
Chattanooga	....	...	....	....	....	....	....	....	....	....	....	......	....	....	......	....	182	134
Dolores	....	....	....	....	....	....	....	....	90	52	66	62	40	50	108	....	176	112
Fair Oaks	....	....	....	....	....	....	....	....	....	....	....	......	....	....	......	....	175	98
Guerrero	....	....	....	....	....	....	....	84	44	40	51	48	35	40	70	....	128	90
San Jose Avenue	....	....	....	....	....	...	....	....	....	....	....	......	....	....	......	....	......	......
Valencia	....	....	....	....	....	40	....	35	30	30	36	36	30	40	50	....	60	70
Mission	....	33	30	28	25	24	20	21	15	18	21	21	23	30	40	....	50	60
Capp	....	....	....	....	....	....	....	....	....	....	....	......	....	36	49	....	52	54
Howard	....	33	24	....	19	....	14	....	8.5	10	13	15	17	30	36	....	46	50
Shotwell	....	....	....	....	....	....	....	....	....	....	E7.5 W 9	......	....	....	......	....	......	47
Folsom	....	21	16	....	13	....	9	....	7.5	4	5	5.5	8	12	28	....	38	44
Treat Avenue	....	....	....	....	....	....	....	....	....	....	....	......	7.5	10.5	......	....	......	38
Harrison	6	14	9	....	7.5	....	....	....	6.5	7.5	9	11	13	12	18	....	30	34
Alabama	....	....	....	....	....	....	....	....	....	....	....	......	....	....	......	....	......	32
Florida	....	....	....	....	....	....	....	....	....	....	....	......	....	....	......	....	......	32
Bryant Avenue	....	....	....	....	....	....	....	....	....	....	....	......	....	....	......	....	......	......
York	...	....	....	....	....	....	....	....	....	....	....	......	....	....	......	....	......	38
Hampshire	....	....	....	....	....	....	....	....	....	...	....	......	....	....	......	....	......	42
Potrero Avenue	....	....	....	....	....	....	....	....	....	....	....	......	....	....	70	....	54	46

No. 6.

MISSION AND HORNER'S ADDITION.

Alvarado......	23d..........	Elizabeth......	24th......	Jersey......	25th......	Clipper	26th......	Serpentine Ave	Army......	27th........	Duncan......	28th......	Valley......	29th......	Day......	30th......
......	......	......	....	....	......	....	....	....	....	....	....	....	.....	....	....	....
......	......	N.482 S. 487	527	....	......	....	....	....	....	....	....	....	.....	....	....	....
......	......	......	....	....	535	....	547	....	....	....	....	....	.....	....	....	....
......	....S E	} 482	448	....	473	....	512	....	....	....	....	....	.....	....	....	....
......	......	......	375	..{	E. 410.5 W.412	....	482	....	....	....	....	....	.....	....	...	....
......	......	336	325	....	392	....	452	....	....	....	....	....	.....	....	....	....
......	......	.....	296	....	348	....	438	....	....	....	....	....	.....	....	....	....
......	......	......	....	....	......	....	....	....	....	....	....	....	.....	....	....	....
299	297	274	266	281	315	362	390	....	430	430	....	....	.....	....	....	....
......	......	......	....	....	......	....	....	....	....	....	....	....	.....	....	....	....
284	242	232	222	230	254	285	320	....	350	380	....	....	.....	....	....	....
E. 340 W.334	......	......	....	....	......	....	....	....	....	....	....	....	.....	....	...	....
310	N.268 S. 265	N.225 S. 223	185	195	207	216	235	....	270	330	....	....	.....	....	....	....
250	208	134	170	158	186	136	200	....	250	260	....	....	.....	190	183	205
......	202	......	167	144	140	161	165	....	163	161	155	153	148	142	135	155
......	198	......	165	....	......	....	....	....	....	....	....	....	.....	....	....	....
......	188	......	164	150	130	120	117	....	115	112	115	123	119.5	117	120	129
......	134	......	167	....	......	....	....	....	....	....	....	....	.....	....	....	....
.....	105	......	165	214	200	170	140	....	116	86	92	102	101	103	105	116
......	100	......	132	153	141	135	118	....	....	....	....	....	.....	....	....	....
......	93	......	109	111	106	102	90	....	70	82	84	85.5	.....	....	....	....
......	.....	......	....	....	... ..	....	....	66	67	81	83	85	86	87	95	102
......	74	......	77	....	78	....	70	62	64	....	....	....	.....	....	....	....
......	60	......	62	....	64	....	62	55	....	50	....	68	.....	92	....	107
......	56	......	58	....	60	....	53	....	....	....	....	....	.....	....	...	....
......	52	......	54	....	56	....	50	....	....	....	....	..	.....	....	....	....
......	45	......	52	....	54	....	48	....	....	....	...	...	.....	....	....	....
......	42	......	48	....	50	....	46	....	....	....	....	....	.....	....	....	....
......	40	......	44	....	47	....	43	....	....	....	....	....	.....	....	....	....
......	37	......	40	....	44	....	40	....	....	....	....	....	.....	....	....	....
......	37	......	40	....	40	....	37	....	....	....	....	....	.....	....	....	....
......	40	......	40	....	33	...	35	....	....	....	....	....	.....	....	....	....
......	......	......	....	....	......	....	....	...	....	....	....	....	.....	....	....	....
......	46	......	40	....	34	....	27	....	....	....	....	....	.....	....	....	....
......	48	......	44	....	30	....	24	....	....	....	....	....	.....	....	....	....
.....	50	......	42	....	28	....	20	....	....	....	....	....	.....	....	....	....

SUPPLEMENTAL TABLE.	
Bartlett and 22d..	64
Bartlett and 23d..	66
Bartlett and 24th..	68
Bartlett and 25th..	70
Bartlett and 26th..	66
Beaver & Castro..	203.80
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Brady & Market...	42
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Henry & Sanchez..	109
Noe and 16th, NW cor..............	126.9
Ocean House Road & County Road..	166
Ocean House R'd & Elizabeth N line.	482
Ocean House R'd & Elizabeth S line.	487
Ocean House R'd & Twenty-fourth..	527
Serpentine avenue and Mission.....	65
Serpentine avenue and Valencia....	62
Serpentine avenue & San Jose ave..	66
S. P. R. R. and San Jose avenue.....	85
S.P.R.R.&Clipper.	88.50
S.P.R.R.&Guerr'ro	95
S. P. R. R. & 26th.	97.50
S.P. R.R. & Army.	106
S.P.R.R.& Duncan	93
S. P. R. R. & 28th..	104
S.P.R.R. & Valley.	109
S. P. R. R. & 29th..	110
S. P. R. R. & 30th.	120

TABLE

SHOWING OFFICIAL

STREET NAMES.	Channel......	Merrimac.....	Alameda......	El Dorado.....	West El Dorado	Hooper......	Irwin.........	Center.........	Hubbell......	South.........
Potrero Avenue	6.5	....	15	30	...	....	...	46	....	....
Utah	....	....	13	14	....	....	....	26	....	....
Nebraska	....	....	10	12	....	....	....	16	....	....
Vermont	....	....	9	11	....	....	....	16	....	....
Kansas	....	....	8	10	....	....	....	15	....	....
Rhode Island	....	....	7	9	....	....	....	14	....	....
De Haro	....	....	....	8	....	....	....	13	....	....
Carolina	....	....	....	....	....	....	....	12	....	....
Wisconsin	...	....	....	....	....	....	....	11	....	....
Eighth	0	....	....	....	....	....	....	....	....	....
Arkansas	....	....	...	....	....	....	....	10	....	....
Connecticut	....	....	....	....	....	....	....	9	....	....
Missouri	....	....	....	....	....	....	....	8	....	....
Texas	....	....	....	....	....	....	....	9	....	....
Mississippi	...	....	....	....	....	....	....	9	....	....
Seventh	0	....	....	9	....	1.8	3.6	....	5.4	7.2
† Pennsylvania Avenue	....	....	....	....	....	....	....	8	....	...
Iowa	....	....	....	....	....	....	....	6	....	....
Indiana	....	....	....	....	....	....	....	6	....	....
Minnesota	....	....	....	....	....	....	....	5	....	....
Sixth	0	....	....	....	....	0	0	....	0	....
Tennessee	....	...	....	....	....	....	....	4	....	....
Kentucky	....	0.75	1.5	2.25	....	...	....	3	...	0
Fifth	0	....	....	....	....	0	0	....	0	....
Illinois	....	....	....	....	..	....	....	1	....	....
Michigan	....	....	....	....	....	....	....	....	....	....
Georgia	....	....	....	....	....	....	...	....	...	....
Fourth	0	....	....	....	....	0	0	....	0	....
Louisiana	....	....	....	....	....	....	....	....	....	....

---

† Some doubt as to grades at intersection of Pennsylvania Avenue with Mariposa and Butte.

No. 7.

GRADES OF THE POTRERO.

Santa Clara....	Mariposa......	Solano..........	Butte..........	Napa..........	Shasta........	Sierra..........	Nevada........	Sonoma........	Yolo..........	Yuba..........	Colusa..........	Marin..........	Tulare..........	Islais..........	Amador	Calaveras......	Mendocino	Plumas........	Fresno..........	India	Twenty-first....
64	57	56	65	70	....	49	49	....	30	....	18	....	....	....	....	....	....	....	....	..	54
60	100	96	136	·146	....	60	56	45	34	....	17	....	....								
58	00	116	166	220	....	74	64	50	48	....	16	....	....								
44	98	138	180	234	....	105	74	58	43	....	15	6	0								
20	73	144	206	255	....	136	86	....	65	....	16	6	0								
16	53	120	180	246	....	192	100	....	122	....	20	10	0								
15	30	60	116	198	....	242	146	....	169	....	20	6	....								
14	22	34	74	140	....	300	194	....	180	....	20	6	0								
13	20	24	68	166	....	284	262	....	150	....	40	10	0								
....	....	....	....	....	....	....	...	....	....	....	....	....	....								
12	22	40	100	180	....	220	235	....	130	....	45	20									
16	N 52 S 53	N 89 S 90	N 126 S 127	N 163 S 161	....	N 192 S 193	N 193 S 192	....	N 81 S 80	....	30	15	} 0								
12	48	114	154	177	....	140	220	....	100	....	10	....	....								
11	46	96	178	154	....	76	138	....	130	....	8	2	....								
11	30	80	154	168	....	40	90	....	90	....	8	....	....								
N 9.86 S 9.53	....	....	....	....	....	...	....	....	....	....	.. .	...	....								
10	18	66	144	130	...	32	36	....	50	....	8	2	....								
7	16	64	162	86	....	30	20	....	30	....	8	3	0								
8	14	50	122	76	....	28	16	....	20	....	8	2	0								
7	12	30	100	74	....	27	14	....	10	8.5	7	3	0								
....	....	....	....	....	....	....	....	....	....	....	....	....	....								
6	10	15	40	56	....	26	12	....	9	8	6.5	2.75	0								
3	5	10	20	30	40	30	11	8	8	7	6	2.5	0	0							
....	....	....	....	....	....	....	....	....	....	...	....	....	....	....							
0	1	3	10	20	30	26	10	6	7	6	5.5	2.25	0	0	0						
....	....	2	8	15	20	22	9	7	6	5.5	5	2	0	0	0.25						
....	....	2	*	12	*	18	8	6	5	4.75	4.5	1.75	0	0	0.5	0					
....	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....					
....	...	2	5	9	12	14	7	5	4	4.5	4	1.5	0	0	0.25	0					

* Closed.

TABLE No. 7

STREET NAMES.	Channel	Merrimac	Alameda	El Dorado	W'st El Dorado	Hooper	Irwin	Center	Hubbell	South
Maryland	....	....	....	....	....	....	....	....	....	....
Delaware	....	....	....	....	....	....	....	....	....	....
Massachusetts	....	....	....	....	....	....	....	....	....	....
New York	....	....	....	....	....	....	....	....	....	....
Virginia	....	....	....	....	....	....	....	....	....	....
Ohio	....	....	....	....	....	....	....	....	....	....
Wyoming	....	....	....	....	....	....	....	....	....	....
Dakota	....	....	....	....	....	....	....	....	....	....
Idaho	....	....	....	....	....	....	....	....	....	....
Arizona	....	....	....	....	...	....	....	....	....	....
Colorado	....	....	....	....	....	....	....	....	....	....
Mexico	. ..	....	....	....	....	....	....	....		....
Alaska	....	....	....		....	....	....	....	....	....
Water Front*	....	....	....	....	....	....	....	....	....	....
Harrison	6	....	....	....	....	....	....	....	....	....
Alabama ‡	6	....	9	12	....	....	....	29	....	....
Florida	6	....	12	20	....	....	....	47	....	....
Bryant Avenue	7.25	....	22	38	....	....	....	66	....	....
York	6	....	28	50	....	....	....	60	....	....
Hampshire	6.75	....	30	50	....	....	....	53	....	....

* Base, for entire length.

SUPPLEMENTAL TABLE.

Humboldt and Delaware	3
Humboldt and Maryland	8
Humboldt and Louisiana	14
Humboldt and Georgia	19

—Continued.

Santa Clara...	Mariposa	Solano........	Butte..........	Napa	Shasta.........	Sierra.........	Nevada.......	Sonoma.......	Yolo...........	Yuba	Colusa........	Marin.........	Tulare........	Islais	Amador	Calaveras.....	Mendocino ...	Plumas.......	Fresno	India.........	Twenty-first ...
....	....	....	4	6	6	6	6	4	3	3.25	3.5	1.25	0	0	0.5	0.25	0				
....	....	....	3	3	3	3	3	3	2	2.5	3	1	0	0	0.25	0.5	0				
....	....	....	....	....	....	....	....	....	1	2	2.5	0.75	0	0	0.5	0.25	0	0			
....	....	....	....	....	....	....	....	....	....	....	2	0.5	0	0	0.25	0.5	0.75	0.25			
....	....	....	....	....	....	....	....	....	....	....	1.5	0.25	0	0	0.5	0.75	0.5	0.25	0		
....	....	....	....	....	....	....	....	....	....	....	1	0	0	0	0.25	0.5	0.75	0.5	0.25		
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0.25	0.5	0.75	0.5		
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	0.25	0.5	0.25	0	
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	0.25	0.5	0	
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	0.25	0	
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	0	
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	
20	21	18	E 15.5	19.4 §	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	25.40
35	30	21	18	19	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	22
50	36	23	26	E† 31.4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	26
60	40	25	32	30	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	W 32
62	42	34	45	44	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	E. 37

† Thence 20 feet, 30: Rem. 30. ‡ W. 55 ft. 9 inches ; Rem. 14.5. § Thence W. 35 ft. 9 in.; Rem. 19.

SUPPLEMENTAL TABLE.

Humboldt and Michigan	20
Humboldt and Illinois	20
Humboldt and Kentucky	20

TABLE

SHOWING OFFICIAL GRADES

Street Names.	Lake	California	California, South	Clement	Point Lobos Avenue	A	B	C
Serpentine Road	......	......	......	......	......	......	......	......
First Avenue	211	190	182	187	192	198	204	214
Second Avenue	192	184	180	183	186	192	198	210
Third Avenue	196	178	174	177	176	186	192	208
Fourth Avenue	194	172	170	173	169	176	184	206
Fifth Avenue	184	166	166	170	166	176	182	206
Sixth Avenue	176	164	164	180	166	176	182	214
Seventh Avenue	154	158	158	170	166	176	182	216
Eighth Avenue	157	157	......	163	166	176	182	218
Ninth Avenue	155	166	......	176	165	166	212	216
Tenth Avenue	150	152	......	185	164.5	190	235	218
Eleventh Avenue	145	136	......	174	164	185	241	219
Twelfth Avenue	143	135	......	145	163	167	220	234
Thirteenth Avenue	141	134	......	142	162	165	207	212
Fourteenth Avenue	128	133	......	145	159	162	208	211
Fifteenth Avenue	125	128	......	150	155	163	220	216
Sixteenth Avenue	123	125	......	155	145	160	225	185
Seventeenth Avenue	120	121	......	135	137.5	150	202	183
Eighteenth Avenue	118	119	......	136	138	148	175	181
Nineteenth Avenue	117	126	......	147	139	162	167	187
Twentieth Avenue	115	122	......	140				
Twenty-first Avenue	114	121	......	135				
Twenty-second Avenue	110	120	......	125				
Twenty-third Avenue	116	118	......	122				
Twenty-fourth Avenue	127	125	......	123				

No. 8.

OF OUTSIDE LANDS.

G.	H.	I.	J.	K.	L.	M.	N.	O.	SUPPLEMENTAL TABLE.	
......	......	......	......	406	356	.....	360		**Serpentine Road.**	
236	250	324	406						San Miguel Rancho line........	372
226	262	324	440						N..............................	360
224	264	300	440						M.............................	356
224	266	280	380						L.............................	356
224	268	274	320	370					Sixth Avenue..................	378
224	266	274	316	344					Fifth Avenue..................	393
224	260	274	304	324	324	330			K...........................	406
224	256	274	284	314	374	444	460	506	Fourth Avenue.................	08
									Third Avenue..................	443
									Second Avenue.................	450
									First Avenue..................	438
									Thence meandering 700 feet.....	406
									Thence meandering 600 feet.....	386
									Willard Centre Line...........	390

TABLE
SHOWING OFFICIAL GRADES

NAMES.	Shipp	Allegheny	St. Lawrence	James	Kaskaskia	Gila	Talapoosa	Santee	Penobscot	Osage	Monongahela
Honduras	......	......	......	......	......	......	......	......	......	......	......
Denmark	......	......	......	......	...	......	......	......	......	0	2
Montenegro	......	......	......	......	......	......	......	......	......	5	3
Manilla	......	......	......	......	......	......	......	......	......	10	5
St. Thomas	6	6	6	12	12	12	9	3	3	16	20
Venezuela	7	15	15	15	15	15	12	6	6	20	40
Trinidad	7	18	18	18	18	18	15	9	13	40	60
Bahama	7	21	21	21	21	21	18	14	23	60	80
Corea	7	24	24	24	24	24	24	34	43	80	N ½ 100 S ½ 140
Marquesas	7	24	24	24	44	44	44	N ½ 54 S ½ 104	100	100	160
Manatoba	7	19	21	21	55	64	64	124	N ½ 120 S ½ 180	180	N ½ 180 S ½ 240
Dominica	......	14	18	18	35	84	84	144	184	N ½ 200 S ½ 244	260
Servia	......	14	15	15	15	N ½ 64 S ½ 32	64	N ½ 124 S ½ 104	164	N ½ 224 S ½ 164	224
Paraquy	......	12	12	12	12	12	N ½ 44 S ½ 24	84	N ½ 144 S ½ 84	144	N ½ 204 S ½ 164
Teneriffe	......	9	9	9	9	9	10	N ½ 64 S ½ 19	64	N ½ 124 S ½ 84	104
Falkland	......	......	7	7	7	7	7	13	44	64	84
Sumatra	......	......	......	6	6	6	6	10	24	44	64
Algeria	......	......	......	......	5	5	5	7	12	24	44
Lahaina	......	......	......	......	......	......	4	6	9	20	30
Mauritius	......	......	......	......	......	......	......	5	6	6	22
Java	......	......	......	......	....	......	......	4	4	5	7
Salvador	.....	....	......	......	......	...	......	......	......	4	6
Grenada	......	.. ...	......	......	......	......	......	......	......	......	......
Islais	......	......	......	......		......	......	......	......	......	......
†India	......	... ..	......	.....	......	......	......	......	......	......	......
Appleton	......	......	......	......	......	......	......	......	......	......	......
Charity	......	......	......	......	......	......	......	......	......	......	......
Elk	......	......	......	......	......	......	......	......	......	......	......
Nye	......	......	......	......	......	......	......	......	......	......	......

* N ½ stands for Center Line of N ½. S ½ stands for Center Line of S ½.

† Base for entire length.

SUPPLEMENTAL TABLE.

Bermuda and R. R. Avenue, centre line of N. half	18.45
Bermuda and R. R. Avenue, centre line of S. half	17.67
Bernadotte and Biggs	Base.

No. 9.

OF SOUTH SAN FRANCISCO.

Savannah........	* R. R. Avenue....	Platte..........	Yazoo..........	Susquehanna	St. John........	Tombigbee........	Silver Avenue.....	Potomac........	San Joaquin.......	St. Francis........	Channel........	Fox...........	Schneider........	Bernadotte.......
......	....	....	0	0	0	0	......	......	......	......	....	....	..	..
1	0	2	1	1	0	0	......	......	......	......	....	....	..	..
2	0	3	2	2	0	0	......	0	0	......	....	....	..	..
3	0	4	3	3	0	0.5	......	0	0	......	....	....	..	..
20	2	20	4	4	1	1	......	0.5	0	......	....	....	..	..
25	3	23	5	5	2	1.5	......	1	0	......	....	....	..	0
45	5	43	13	6	3	2	......	1.5	0	0	....	....	0	..
65	6	63	29	7	4	3	......	2	1	0	....	....	0	..
85	N ½ 7.44 S ½ 8.8	N ½ 83 S ½ 107	47	To conf'm with R. R. Ave	6	4	......	2.5	1.5	0.5	....	....	0	..
167	N ½ 15.76 S ½ 16.4	127	67	"	8	5	......	3	2	......	....	....	0	..
187	N ½ 24 S ½ 24.72	137	67	19	10	6	......	3.5	......	......	....	2.5	..	..
207	N ½ 32.4 S ½ 33.4	137	67	28	13	7	......	4	......	......	....	2.5	..	..
187	N ½ 40.72 S ½ 41.36	124	60	32	20	8	......	4.5	......	......	....	3	..	Base for entire length....1
184	N ½ 49.4 S ½ 49.68	124	62	38	33	19	......	5	......	......	....	3.5	..	
N ½ 164 S ½ 114	N ½ 57.36 S ½ 58	104	60	52	50	34	......	10	4	......	....	4	..	
94	N ½ 64.6 S ½ 65.15	104	....	90	N ½ 77 S ½ 86	48	......	22	4.5	......	....	4.5	..	
77	N ½ 71.75 S ½ 72.3	84	To conf'm with R. R. Ave	138	144	75	......	50	21	......	....	8	..	
60	N ½ 78.9 S ½ 78.51	72	90	166	192	102	......	88	40	......	....	9	..	
47	N ½ 69.15 S ½ 68.37	61	104	166	222	142	......	123	80	......	....	10	..	
34	N ½ 59.1 S ½ 58.23	52	108	157	237	185	......	145	130	......	....	....	..	..
22	N ½ 48.87 S ½ 48 9	45	....	....	......	......	......	......	......	......	....	....	..	..
9	N ½ 38.73 S ½ 37.95	....	....	....	......	......	......	......	......	......	....	....	..	..
......	N ½ 28.59 S ½ 27.81	....	....	....	......	......	......	......	......	.....	....	....	..	..
......	....	....	....	....	......	......	......	0	0	......	....	....	..	0
......	....	....	....	....	......	......	......	......	......	......	....	....	..	..
......	....	....	....	....	......	......	......	......	......	......	3	3.5	..	..
......	....	....	....	....	......	......	......	......	......	......	4	4	..	..
......	....	....	....	....	......	......	......	......	......	......	5	8	..	..
......	....	....	....	....	......	......	......	......	......	......	6	....	..	..

SUPPLEMENTAL TABLE.

Bernadotte and Mazzini	Base.
Mazzini and Bernadotte	Base.
Mazzini and Schneider	Base.

TABLE NO. 10.

SHOWING OFFICIAL GRADES OF HOMESTEADS, ETC.

STREETS.	STREETS.	FEET.
Army	Valencia	64
Bacon	Bowdoin	137
Bacon	Dartmouth	160
Bacon	College	168
Bacon	University	176
Bowdoin	Mansell	338
Bowdoin	Olmstead	270
Bowdoin	Dwight	173
Bowdoin	Woolsey	108
Bowdoin	Wayland	145
Bowdoin	Bacon	137
Bowdoin	Burrows	150
Bowdoin	Felton	114
Bowdoin	Silliman	126
Bowdoin	Silver avenue	127
Burrows	Bowdoin	150
Burrows	Dartmouth	152
Burrows	University	173
California avenue	Virginia avenue	119
California avenue	Esmeralda avenue	136
College avenue	Bacon	168
College avenue	Felton	149
Columbia place	Ripley place, N line	132
Columbia place	Precita avenue, N line	35
Columbia place	60 feet S of N line of Precita Avenue	36
Columbia place	Precita place, S line	39
Congress	Epstein	443
Congress	San Miguel Rancho line	460
County road	Twenty-seventh	50
County road	Precita	56
County road	Twenty-eighth	68
County road	Fair avenue	68
County road	Twenty-ninth	92

TABLE No. 10– CONTINUED.

SHOWING OFFICIAL GRADES OF HOMESTEADS, ETC.

STREETS.	STREETS.	FEET.
County road	Thirtieth	107
County road	Thirty-first	125
County road	Randall	152
County road	Cresent avenue	210
County road	Point 240 feet south of Cresent avenue	213
County road	Point 280 feet south of last named point	210
County road	Point 970 feet south of last named point	156
County road	Point 910 feet south of last named point	102
County road	Point 150 feet south of last named point	102
County road	Marshall	110
County road	Nye	125
County road	Blank	143
County road	Silver avenue	148
County road	Tingley	155
County road	Theresa	160
County road	Cotter	164
County road	Francis	167
County road	China	169
County road	Croke	171
County road	Harrington	170
County road	Brazil	168
County road	Norton	168
County road	Ocean House road	166
County road	Bauer	166
County road	Persia	164
County road	Russia	160
County road	France	157
County road	Italy	160
County road	Mohawk avenue	168
County road	Geneva avenue	187
County road	Niagara avenue	203
County road	Mount Vernon avenue	220
County road	Ottowa avenue	236

TABLE No. 10—CONCLUDED.

SHOWING OFFICIAL GRADES OF HOMESTEADS, ETC.

STREETS.	STREETS.	FEET.
County road	Foote avenue	253
County road	Naglee avenue	273
County road	Lowell	279
County road	Worden	289
County road	Farragut avenue	298
County road	Olivia	303
County road	Sherman avenue	303
County road	Sickles avenue	310
County road	Acton	310
County road	Huron avenue	317
Cresent avenue	Mission	210
Dartmouth	Bacon	160
Dartmouth	Burrows	152
Dartmouth	Felton	133
Dartmouth	Silliman	142
Dartmouth	Silver avenue	141
Fair avenue	Mission	68
Felton	Bowdoin	114
Felton	Dartmouth	133
Felton	College	149
Felton	University	165
Fifteenth avenue Extension	Channel	—1
Fifteenth avenue Extension	Nashua	—1
Fifteenth avenue Extension	Bourne	—1
Fifteenth avenue Extension	Alcatraz	—1
Fifteenth avenue Extension	Adele	—1
Fifteenth avenue Extension	Stringham	—1
Fifteenth avenue Extension	Barneveld avenue (late Railroad avenue)	—1
Fifteenth avenue Extension	Loomis	—1
Fifteenth avenue Extension	Patterson	Base
Fifteenth avenue Extension	San Bruno Avenue	10
Flint	Sixteenth	238
Flint	President	330

TABLE No. 10—CONTINUED.

SHOWING OFFICIAL GRADES OF HOMESTEADS, ETC.

STREETS.	STREETS.	FEET.
Flint	Albany	402
Levant	San Miguel Rancho line	375
Levant	State	397
Levant	Epstein	407
Osborne (late Eureka)	State	259
Osborne (late Eureka)	Sixteenth	317
Piedmont	Epstein	446
Piedmont	San Miguel Rancho line	405
Precita avenue	Columbia place, N line	35
Precita avenue	Columbia place, 60 feet S of N line	36
Precita avenue	Columbia place, S line	39
Precita avenue	Folsom, N line	64
Precita avenue	Folsom, S of N line	65
Precita avenue	Bernal	57
Precita avenue	Mission	56
Precita avenue	Alabama, N side	35
Precita place	Columbia place, S side	39
Precita place	Folsom	68
Railroad avenue	Bermuda, center line of N half	18.45
Railroad avenue	Bermuda, center line of S half	17.6
Ripley place	Columbia place, N line	132
Ripley place	Folsom	200
San Bruno avenue	Fifteenth avenue Extension	10
San Bruno avenue	Ricard	22
San Bruno avenue	Gaven	34
San Bruno avenue	Sweeney	42
San Bruno avenue	Hale	50
San Bruno avenue	Silver avenue	58
San Miguel Rancho line	Levant	375
San Miguel Rancho line	Congress	460
San Miguel Rancho line	Piedmont	405
San Miguel Rancho line	Serpentine road	372
Silliman	Bowdoin	126

TABLE No. 10—Continued.

SHOWING OFFICIAL GRADES OF HOMESTEADS, ETC.

Streets.	Streets.	Feet.
Silliman	Dartmouth	142
Silver avenue	Conkling	104
Silver avenue	Bowdoin	127
Silver avenue	Dartmouth	141
Silver avenue	San Bruno avenue	58
Silver avenue	Mission	148
South Broderick	Tilden	298
South Broderick	Fourteenth	310
Tiffany avenue	Twenty-eighth	68
Tiffany avenue	Twenty-ninth	82
Tilden	South Broderick	298
Tilden	Epstein	392
University	Wayland	171
University	Bacon	176
University	Burrows	173
University	Felton	165
Van Buren (late Java)	Epstein	428
Wayland	Bowdoin	145
Wayland	University	171

TABLE NO. 11.

INTERMEDIATE GRADES OF CITY AND COUNTY.

STREET.	STREETS.	FEET.
Alabama	Midway between Twenty-fourth and Twenty-fifth	42
Albany	Opposite dividing line of lots 68 and 69, block 9	420
Albany	Opposite dividing line of lots 2 and 3, block 10	443
Albany	Opposite dividing line of lots 26 and 30, block 11	418
Alemany avenue	Midway between Turk and Eddy	258
Algeria	Midway between Yazoo and Susquehanna	120
Algeria	Midway between Susquehanna and St. John	214
Alvarado	250 feet west from Castro	340
Alvarado	250 feet east from Diamond	334
Arkansas	433 feet south from Napa	215
Arkansas	448 feet south from Sierra	273
Ashbury	950 feet south from Frederick	412
B	120 feet west from Fourteenth avenue	224
Bellevue	64 feet south from Elizabeth	474
Bellevue	123 feet north from Twenty-fifth	487
Boardman place	Midway between Bryant and Brannan	9
Bowdoin	100 feet northwest from Wayland	150
Brannan	412 feet 6 inches west from Second	25.41 2-3
Brannan	206 feet 3 inches west from Third	10.50
Brannan	412 feet 6 inches west from Third	5
Brannan	Midway between Eighth and Ninth	1
Broadway	237 feet 6 inches west from Taylor	293
Broderick	Midway between McAllister and Golden Gate avenue	244
Broderick, E side	137 feet 6 inches south from Eddy	241
Broderick, W side	137 feet 6 inches south from Eddy	244
Broderick	137 feet 6 inches north from Eddy	220
Bryant	275 feet west from First	52
Bryant	275 feet east from Third	12
Bryant	Midway between Seventh and Eighth	11
Bulah	Midway between Stanyan and Cole	263
Burritt	137 feet 6 inches south from Bush	109.40
Bush, S line	275 feet east from Stockton, to conform to Bush street and Grant Avenue (building line).	

TABLE No. 11—Continued.

INTERMEDIATE GRADES OF CITY AND COUNTY.

Street.	Streets.	Feet.
California avenue	400 feet north from Virginia avenue	125
California	137 feet 6 inches west from Montgomery	15
Carl	Midway between Stanyan and Cole	315
Carolina	400 feet south from Nevada	230
Carolina	66 feet south from last named point	230
Castro	Midway between Eighteenth and Nineteenth	115
Castro	228 feet south from Twenty-first	310
Chattanooga	Midway between Twenty-second and Twenty-third	136
Chattanooga	197 feet south from Twenty-third	137
Chestnut	Midway between Devisadero and Broderick	22
Chestnut	Midway between Broderick and Baker	22
Church	Midway between Seventeenth and Eighteenth	65
Clay	137 feet 6 inches east from Mason	218
Clayton	400 feet south from Carl	344
Clementina	275 feet east from Third	24
Cole	Midway between Waller and Frederick	269.50
Columbia place	500 feet south from Precita place	80
Connecticut	400 feet south from Napa	190
Connecticut	66 feet south from last named point	190
Connecticut	433 feet south from Sierra	233
Cushman	100 feet north from California	284.22$\frac{11}{12}$
Cushman	100 feet south from Sacramento	284.62½
De Boom	275 feet east from Second	37.81
Decatur	275 feet southeast from Bryant	10.65
De Haro	400 feet south from Napa	260
De Haro	66 feet south from last named point	260
De Haro	400 feet south from Nevada	184
De Haro	66 feet south from last named point	184
Delaware	Midway between Nevada and Sonoma	4
Diamond	260 feet south from Seventeenth	150
Diamond	260 feet south from Eighteenth	138
Douglass	260 feet south from Seventeenth	184

TABLE No. 11—Continued.

INTERMEDIATE GRADES OF CITY AND COUNTY.

Street.	Streets.	Feet.
Douglass	260 feet south from Eighteenth	170
Douglass	60 feet south from Nineteenth	268
Dupont	37 feet 6 inches south from Green	90.5
Dupont	137 feet 6 inches south from Filbert	107.5
Dupont	137 feet 6 inches south from Lombard	160
El Dorado	Midway between Hampshire and York	55
Ellen	260 feet south from Twenty-fourth	350
Epstein	Opposite dividing line of lots 31 and 36, block 5	450
Essex	412 feet 6 inches west from First	94
Fair Oaks	Midway between Twenty-third and Twenty-fourth	113.50
Fair Oaks	Midway between Twenty-fourth and Twenty-fifth	153
Fair Oaks	Midway between Twenty-fifth and Twenty-sixth	135
Falkland	Midway between Susquehanna and St. John	100
Falkland	Midway between St. John and Tombigbee	68
Fell	206 feet 3 inches west from Steiner	242
Fifteenth avenue	300 feet north from A	158
Fifteenth	100 feet west from Noe	141.23
Filbert, S side	260 feet 10½ inches east from Mason	57.50
Filbert	Midway between Laguna and Buchanan	50
First	206 feet 3 inches south from Harrison	103
Flint	Opposite lot 42, block 9	302
Flint	Opposite lot 20, block 11	350
Folsom	362 feet 6 inches east from Second	39.53
Folsom	387 feet 6 inches west from Second	31.97
Folsom	Midway between Sixteenth and Seventeenth	7
Fourteenth	320 feet west from Castro	242
Fourteenth	460 feet west from Castro	266
Frederick	Midway between Stanyan and Cole	285
Fremont	275 feet south from Market	4
Front	Midway between Pacific and Broadway	3.66⅔
Front	Midway between Broadway and Vallejo	3.66⅔
Geary	Midway between Octavia and Gough	206

TABLE No. 11—CONTINUED.

INTERMEDIATE GRADES OF CITY AND COUNTY.

STREET.	STREETS.	FEET.
Geary	137 feet 6 inches east from Buchanan	140.66⅔
Golden Gate avenue	Midway between Baker and Lyon	246
Green	145 feet west from Montgomery	202
Green	245 feet west from Montgomery	192
Green	206 feet 3 inches west from Kearny	118
Green	137 feet 6 inches west from Dupont	85
Green	309 feet west from Jones	283.50
Greenwich	68 feet 9 inches west from Kearny	206
Greenwich	137 feet 6 inches east from Dupont	162
Greenwich	150 feet west from Hyde	303
Guerrero	Midway between Twenty-fourth and Twenty-fifth	111
Guerrero	Midway between Twenty-fifth and Twenty-sixth	102
Hampshire	Midway between Twenty-fourth and Twenty-sixth	43
Harrison	412 feet 6 inches west from First	94
Harrison	362 feet 6 inches east from Second	94
Harrison	275 feet west from Second	90
Harrison	387 feet 6 inches west from Second	74.25
Hawthorne	68 feet 9 inches south from Folsom	43.6
Hawthorne	137 feet 6 inches south from Folsom	66.17
Hawthorne	206 feet 3 inches south from Folsom	60.76
Henry	320 feet west from Castro	225
High	260 feet south from Twenty-fourth	544
Hill	115 feet east from Guerrero	93
Hill	250 feet east from Guerrero	81
Hyde	118 feet north from Francisco	140
Hyde	Midway between Filbert and Greenwich	294
Indiana	400 feet south from Sierra	18
Indiana	66 feet south from last named point	18
Iowa	400 feet south from Sierra	22
Iowa	66 feet south from last named point	22
Jackson	100 feet east from Jones	284
Jackson	Midway between Broderick and Devisadero	273

TABLE No. 11—Continued.

INTERMEDIATE GRADES OF CITY AND COUNTY.

Street.	Streets.	Feet.
Kearny	137 feet 6 inches south from Green	159
Kentucky	Midway between Center and Santa Clara	4
Larkin	118 feet north from Francisco	140
Liberty	180 feet east from Dolores	140
Lombard	Northerly 40 feet in width 215 feet west from Hyde	273
Lombard	Southerly 15 feet in width 22 feet west from Hyde	285
Lombard	106 feet west from Hyde	288
Lombard	250 feet west from Hyde	283
Lombard	Midway between Broderick and Baker	31
Lucy	523 feet south from Frederick	412
Main	343 feet 9 inches south from Harrison	6
Mariposa	Midway between Utah and Nebraska	101
Market	Midway between Tenth and Eleventh	43
Maryland	Midway between Napa and Shasta	7
Maryland	Midway between Shasta and Sierra	7
Masonic avenue	Midway between Waller and Frederick	323
McAllister	Midway between Lyon and Lott	216
Minnesota	400 feet south from Sierra	16
Minnesota	66 feet south from last named point	16
Mission	Midway between Twenty-second and Twenty-third	61
Mission	473 feet south from Twenty-sixth	40
Mississippi	Midway between Nevada and Yolo	92
Missouri	433 feet south from Napa	142
Montgomery avenue, E line	109 feet 4¼ inches northwest from intersection with west line of Kearny	39.74
Montgomery avenue, E line	163 feet 4¼ inches northwest from intersection with west line of Kearny	44
Montgomery avenue	Between Vallejo and intersection of Stockton and Green, to conform to said intersection	....
Montgomery avenue, W line	75 feet northwest from Vallejo	84.34
Montgomery avenue, E line	141 60-100 feet northwest from Vallejo	83.42
Myrtle avenue	137 feet 6 inches east from Laguna	176.66⅔
Nineteenth	305 feet west from Church	157.23
Noe	Midway between Twenty-fifth and Clipper	187
Ocean House road	260 feet south from Twenty-fourth	541

ANNUAL REPORT

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S. HARRISON SMITH,

SURVEYOR

OF THE

City and County of San Francisco,

FOR THE

FISCAL YEAR ENDING JUNE 30, 1888.

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REPORT

OF THE

CITY AND COUNTY SURVEYOR.

Office of the City and County Surveyor,
San Francisco, Cal., June 30, 1888.

To the Honorable the Board of Supervisors
Of the City and County of San Francisco:

Gentlemen: In compliance with your Resolution, No. 786 (Third Series), passed June 11, 1888, I have the honor to submit the following report:

INTRODUCTORY.

In my last annual report I attempted to give a brief history of the City Surveys, together with principal features and peculiarities of each of its eight subdivisions, and in the appendix I gave a revised table of all the City Grades. This year I had proposed not only to give the information necessary under the several heads generally adopted for the report of such a Department as this, but to add an appendix containing suggestions upon the sewerage question, which is just now agitating the minds of the general public and attracting the attention of every City officer who is in any way connected with our street work. To do justice to this subject, and yet to present it in such a clear and simple manner as to make it intelligible to every member of the community, required so much time that I have found myself obliged to omit much useful and interesting information concerning our streets that I had intended also to embody in the appendix to this report. I would especially call the attention of your Honorable Body to the matter contained in the main body of this report under the heading, "Requirements of the Office."

STREET IMPROVEMENTS.

In addition to the office of City and County Surveyor, I hold, by an appointment of the Board of Supervisors, the office of City Engineer, which appointment, under the Street Law of 1885, and by virtue of said Act, devolves upon the City and County Surveyor.

For the first six months of my incumbency of this office, no work was done under this law, and little, if any, important street improvement; but, after the law had been decided to be in force by the Supreme Court, my attention was quickly drawn to the great necessity that existed of improving the methods of constructing all our work, especially of sewerage. I regret to say, that the last-named class of work is the only one over which I had even the appearance of control, and this only so far as the preparation of specifications, and not over the construction.

This I have regretted extremely, but have been powerless to obviate entirely, although our Superintendent of Streets has shown a willingness to assist me to a great extent. One of the greatest obstacles to overcome has been the bad condition of the work with which we have to connect, this being not only faulty in its construction, but absolutely devoid of system, principle, or theory.

In preparing for any work I found myself entirely in the dark as to the existing state of things, and in many cases it was absolutely impracticable to make the necessary examinations. These facts I found especially embarrassing when called upon to draw up specifications.

Another fact, which I found to be a great drawback (in following out any plan or system which I might lay down for my guidance), was that a Resolution of Intention, describing the work to be performed, was passed by your Honorable Body first, and then referred to me for specifications. These Resolutions, in very many cases, called for a class of work, as to size and material, very contrary to what I, as Engineer, would have suggested. I have, however, attempted, in the wording of the specifications, to overcome, as much as possible, what seemed to me to be the errors of the Resolution. But I will postpone further remarks upon this subject to a future portion of this Report, where I will attempt to give you some practical ideas upon the sewerage problem generally, and also as applied to this City.

In connection with the drainage of a city, there is one point which is too frequently neglected, and to which I must call your attention, and that is the proper construction of the streets, so that they may not only act as a passage way for vehicles, but in cases of urgent necessity assist the underground drains in carrying off the surplus amount of surface water which falls during the time of excessive storms.

Our streets, as at present constructed, are capable of carrying very little surface water without overflowing the sidewalks and causing considerable inconvenience to pedestrians. This is especially noticeable where there is a change of grade from one of abrupt descent to one which is level, or comparatively so, such as the crossing of two streets in the more hilly districts of our City. Our streets, as at present constructed, consist of a curb, the top of which is placed upon the official grade; this has a dressed outside surface of some six inches; the paving of the roadway is brought directly against it at a depth generally not exceeding three or four inches, and beginning to rise immediately at this point, theoretically, at the rate of one-half inch to the foot, but practically with much greater rapidity, threby leaving very little waterway below the curb line for times of flood. The necessity of properly constructing our streets is becoming more and more apparent, as the tendency in all sanitary works of recent construction is to reduce all underground drains to the smallest possible size consistent with the ordinary requirements. It has been frequently demonstrated that large quantities of water can be carried for long distances on the surface of the streets without any serious impediment to traffic, and often with great relief to the underground drains ; but to accomplish this, the centre or crown of the street should be little, if any, higher than the top of the curb line, and regularly formed gutter-ways should be made, with their botttoms from eight to nine inches below and from six to eight inches outside the curb line.

Many other suggestions for improving our street work could here be introduced, but they do not properly belong to this Department, nor do they, in any way, affect the drainage problem, over which alone, as before stated, I assume even a semblance of control.

REQUIREMENTS OF THE OFFICE.

In relation to the many improvements that should be made in the present data, and the additions thereto necessary for the more efficient and satisfactory working of this office, I can only refer you to my report of last July, and the communications made, from time to time, by me to your Honorable Body, and state that little or no improvement has been made in any direction since that date. It is true that I have, during the past year, revised the tables of grades to some extent, and extended the base line of monuments on Point Lobos avenue from Eighth to Twenty-first avenue; but, as compared with the work of this kind that should be done, this is a mere bagatelle; and as our city grows and extends there should be some fund from which the expenses of extending the City base lines in the proper directions could be defrayed; for it would seem to be a sad state, and one liable to lead to much future trouble and confusion, where the many persons owning lots of land in the outside tracts adjoining the City, covered by what are known as the different homesteads, and occupying at least one-third of the area of our City and County, should be unable to obtain an Official Survey of their property, owing to the extraordinary expense attendant upon the extension of these base lines to their vicinity.

To obviate this, I would suggest that such a sum of money be appropriated for this purpose, and placed under the control of your Street or Finance Committee as would allow your Surveyor to appoint one draughtsman, one assistant engineer and three rodmen to attend to this work.

I would also state that no action has been taken by your Honorable Board in reference to the compilation of a new Official Map, the copying of one Block Book and of some of the Maps of Record in this office, which work was recommended by me in my last annual Report; also, that daily complaints are made on this score, either by the City and County Attorney, the Courts, or other parties who are obliged to consult these papers, upon which so many property interests depend. As to discrepancies which have been found from time to time in the different surveys, there are many that it is too late to remedy; but there are also many which it is very important should be corrected as soon as possible, and which I think could be reconciled were my above suggestion of an appropriation carried into effect.

Among the most important of these may be mentioned such as exist in the Market Street, Precita Valley, West End and College Homesteads, the Gift Maps, and others.

TABLES OF WORK PERFORMED FROM JULY 1st, 1887, TO JUNE 30th, 1888.

No. 1.

COMPARATIVE TABLE OF SURVEYS.

SUBDIVISIONS.	SURVEYS MADE.		TOTAL NO. OF SURVEYS.
	From June 30, 1886, to June 30, 1887	From June 30, 1887, to June 30, 1888......	For two Years ending June 30, 1888 ......
Fifty-vara Survey..........	116	68	184
One hundred-vara Survey........................	76	69	145
Mission and Horner's Addition	184	190	374
Western Addition.............................	230	203	433
Potrero...	9	8	17
South San Francisco	3	15	18
Outside Lands.....................................	14	19	33
Homesteads	10	14	24
Total..	642	586	1,228

TABLE No. 2.

SHOWING TOTAL AMOUNT OF STREET WORK ON WHICH CERTIFICATES HAVE BEEN ISSUED BY THIS OFFICE FROM JULY 1st, 1887, TO JUNE 30th, 1888.

Certificate—Number	LOCATION. Name of Subdivision.	Grading—Lineal Feet......	Macadam—Lineal Feet....	CURBS. Stone — Lineal Feet............	CURBS. Wood — Lineal Feet............	Paving—Square Feet.......	SEWERS. Brick — Lineal Feet..........	SEWERS. I. S. Pipe—Lineal Feet............	Corners—Number of.......
21	Fifty-vara Survey..	....	....	3,506	....	73,983	293	2,550	13
21	One hundred-vara Survey..........................	....	550	7,700	1,100	140,497	1,225	2,500	8
144	Mission and Horner's Addition..................................	3,503	13,230	7,415	27,744	92,282.	3,874	28,547	146
163	Western Addition	3,034	5,509	6,728	8,230	136,189	2,636	30,599	152
6	Potrero..	4,866	....	....	....	....	80	1,266	4
......	South San Francisco...	....	....	....	....	....	....	....	....
9	Outside Lands..	1,145	1,760	1,200	2,160	....	....	....	4
......	Homesteads...	....	....	....	....	....	....	....	....
364	Total	12,548	21,049	26,549	39,234	442,951	8,108	65,462	327

TABLE No. 3.

GRADES CHANGED AND ESTABLISHED DURING THE YEAR,

FROM JULY 1st, 1887, TO JULY 1st, 1888.

Order.	Date.	Street.	Elevation.	
			Old.	New.
No. 1924....	July 26, 1887...	Center line of Market and W line Valencia........	....	45.37
No. 1924....	July 26, 1887...	SE line of Market and W line of Valencia..........	....	44.38
No. 1924....	July 26, 1887...	Center line of Market, op. inter. of NW line of Market and N line of Waller....................	....	52
No. 1924....	July 26, 1887...	NW line of Market and N line of Waller..........	....	52
No. 1924....	July 26, 1887...	SE line of Market and N line of Herman..........	....	59
No. 1924....	July 26, 1887...	NW line of Market and W line of Octavia.........	....	60.50
No. 1924....	July 26, 1887...	SE line of Market and S line Herman..........	....	65.70
No. 1924....	July 26, 1887...	Center line of Market and E line of Guerrero......	....	81.08
No. 1924....	July 26, 1887...	NW line of Market and N line of Herman.........	....	83.40
No. 1924....	July 26, 1887...	SE line of Market and E line of Guerrero.........	....	85.50
No. 1924....	July 26, 1887...	SE line of Market and W line of Guerrero........	....	89
No. 1924....	July 26, 1887...	Center line of Market and E line of Laguna.......	....	90.21
No. 1924....	July 26, 1887...	NW line of Market and W line of Laguna.........	....	91.50
No. 1924....	July 26, 1887...	Center line of Market and W line of Laguna......	....	93.27
No. 1924....	July 26, 1887...	SE line of Market and N line of Ridley...........	....	101.50
No. 1924....	July 26, 1887...	Center line of Market and N line of Ridley.......	....	103.25
No. 1924....	July 26, 1887...	SE line of Market and S line of Ridley............	....	105
No. 1924....	July 26, 1887...	NW line of Market and E line of Buchanan.......	....	106
No. 1924....	July 26, 1887...	NW line of Market and W line of Buchanan......	....	107 50
No. 1924....	July 26, 1887...	SE line of Market and E line of Dolores...........	....	110
No. 1924....	July 26, 1887...	Center line of Market, op. inter. SE line Market and E line of Dolores............	....	110
No. 1924....	July 26, 1887...	SE line of Market and W line of Dolores.........	....	105.50
No. 1924....	July 26, 1887...	NW line of Market and N line of Reservoir......	....	103.50
No. 1924....	July 26, 1887...	Center line of Market and S line of Reservoir.....	....	100.90
No. 1925....	July 26, 1887...	NW line of Market and S line of Reservoir.......	....	99
No. 1924...	July 26, 1887...	SE line of Market and N line of Fourteenth......	....	89.50
No. 1924....	July 26, 1887...	Center line of Market and N line of Fourteenth..	....	87.30
No. 1924....	July 26, 1887...	SE line of Market and S line of Fourteenth......	....	86.50

TABLE No. 3—Continued.

GRADES CHANGED AND ESTABLISHED DURING THE YEAR.

Order.	Date	Street.	Elevation.	
			Old.	New.
No. 1924....	July 26, 1887...	Center line of Market and S line of Fourteenth..	....	86.50
No. 1924....	July 26, 1887...	NW line of Market and E line of Church	....	86.50
No. 1924....	July 26, 1887...	NW line of Market and W line of Church........	....	86.50
No. 1924....	July 26, 1887...	Center line of Market and Center line of Church.	....	86.50
No. 1924....	July 26, 1887...	SE line of Market and E line of Church	....	86.50
No. 1924....	July 26, 1887...	SE line of Market and W line of Church.........	....	90.14
No. 1924....	July 26, 1887...	SE line of Market and N line of Fifteenth........	....	112 50
No. 1924....	July 26, 1887...	Center line of Market and N line of Fifteenth....	....	114.89
No. 1924....	July 26, 1887...	SE line of Market and S line of Fifteenth........	....	116.50
No. 1924....	July 26, 1887...	NW line of Market and E line of Sanchez........	....	116.50
No. 1924....	July 26, 1887...	Center line of Market and E line of Sanchez......	....	116.62
No. 1924....	July 26, 1887...	NW corner of Sanchez and Fifteenth.....	....	116
No. 1924....	July 26, 1887...	SE line of Market and E line of Sanchez.........	....	117
No. 1924....	July 26, 1887...	NW line of Market and S line of Fifteenth.......	....	117.20
No. 1924....	July 26, 1887...	SE line of Market and W line of Sanchez..	....	117.50
No. 1924....	July 26, 1887...	SE line of Market and N line of Sixteenth........	....	125
No. 1924....	July 26, 1887...	NW line of Market and E line of Noe............	....	125
No. 1924....	July 26, 1887...	Center line of Market and N line of Sixteenth....	....	126
No. 1924....	July 26, 1887...	SE line of Market and S line of Sixteenth........	....	126 50
No. 1924....	July 26, 1887...	SE line of Market and E line of Noe.............	....	126.80
No. 1924....	July 26, 1887...	NW corner of Noe and Sixteenth..................	....	126.80
No. 1924....	July 26, 1887...	Center line of Market and W line of Noe	....	127.58
No. 1924....	July 26, 1887...	SE line of Market and W line of Noe.............	....	128.50
No. 1924....	July 26, 1887...	NW line of Market and S line of Sixteenth.......	....	128.50
No. 1924....	July 26, 1887...	NW line of Market and E line of Castro..........	....	139
No. 1924....	July 26, 1887...	SE line of Market and N line of Seventeenth......	....	137.42
No. 1924....	July 26, 1887...	Center line of Market and E line of Castro........	....	137.50
No. 1924....	July 26, 1887...	Center line of Market and Center line of Castro...	....	138
No. 1924....	July 26, 1887...	SE corner of Seventeenth and Castro.............	....	138
No. 1924....	July 26, 1887...	NW corner of Seventeenth and Castro............	....	139
No. 1924....	July 26, 1887...	SW corner of Seventeenth and Castro............	....	138
No. 1925....	Sept. 2, 1888...	Hartford. 260 feet S from Eighteenth.............	....	114.50

TABLE No. 3—CONTINUED.

GRADES CHANGED AND ESTABLISHED DURING THE YEAR.

ORDER.	DATE.	STREET.	ELEVATION.	
			Old.	New.
No. 1928	Oct. 11. 1887	Crossing Napa and Connecticut	163	183
No. 1929	Oct. 11. 1887	N line of Twentieth and Collingswood	230	226
No. 1934	Oct. 25, 1887	Crossing Napa and Wisconsin	166	176
No. 1934	Oct. 25, 1887	Crossing Napa and Carolina	140	160
No. 1936	Nov. 16, 1887	Carolina, 142 feet N from Sierra		285
No. 1936	Nov. 16, 1887	Arkansas, 244 feet S from Napa		217
No. 1936	Nov. 16, 1887	Arkansas, 433 feet S from Napa	215	Abolish'd
No. 1936	Nov. 16, 1887	De Haro. 310 feet N from Sierra		285
No. 1936	Nov. 16, 1887	De Haro, 400 feet N from Sierra	260	Abolish'd
No. 1939	Nov. 16, 1887	Juniper, 412 feet 6 inches SE from Folsom		15.50
No. 1940	Dec. 2, 1887	N line Noe and Twenty-third	208	216
No. 1940	Dec. 2, 1887	S line Noe and Twenty-third	208	213
No. 1940	Dec. 2, 1887	N line Noe and Elizabeth	184	189
No. 1940	Dec. 2, 1887	S line Noe and Elizabeth	184	186
No. 1940	Dec. 2, 1887	Diamond and Twenty-third	242	248
No. 1940	Dec. 2, 1887	N line of Twenty-third, 205 feet E from Castro		263
No. 1940	Dec. 2, 1887	S line of Twenty-third, 205 feet E from Castro		260
No. 1940	Dec. 2. 1887	N line of Twenty-third, 250 feet W from Castro		263
No. 1940	Dec. 2, 1887	S line of Twenty-third, 250 feet W from Castro		260
No. 1941	Dec. 2, 1887	Crossing Church and Twentieth	130	142
No. 1942	Dec. 16, 1887	Crossing Vallejo and Scott		210
No. 1942	Dec. 16, 1887	Crossing Vallejo and Devisadero		250
No. 1942	Dec. 16, 1887	Crossing Vallejo and Broderick		198
No. 1942	Dec. 16. 1887	Crossing Green and Scott		180
No. 1942	Dec. 16, 1887	Crossing Green and Devisadero		210
No. 1942	Dec. 16, 1887	Crossing Green and Broderick		150
No. 1942	Dec. 16. 1887	Crossing Union and Scott		132
No. 1942	Dec. 16, 1887	Crossing Union and Devisadero		150
No. 1942	Dec. 16, 1887	Crossing Union and Broderick		130
No. 1942	Dec. 16, 1887	Crossing Filbert and Scott		82
No. 1942	Dec. 16, 1887	Crossing Filbert and Devisadero		100

TABLE No. 3—Continued.

GRADES CHANGED AND ESTABLISHED DURING THE YEAR.

Order.	Date.	Street.	Elevation.	
			Old.	New.
No. 1942....	Dec. 16, 1887...	Crossing Filbert and Broderick....................	....	104
No. 1944....	Dec. 16, 1887...	State, 550 feet W from Castro....................	....	245
No. 1944....	Dec. 16, 1887...	State, 1,250 feet W from Castro..................	....	277
No. 1944....	Dec. 16, 1887...	State, 1,675 feet W from Castro..................	....	319
No. 1944....	Dec. 16, 1887...	State, between Castro and Levant.................	....	Abolish'd
No. 1947....	Jan. 30, 1888...	Castro, N line of Thirtieth........................	....	319
No. 1947....	Jan. 30, 1888...	Castro, S line of Thirtieth........................	....	323
No. 1947,...	Jan. 30, 1888...	Castro, 520 feet S from Thirtieth.................	....	427
No. 1947....	Jan. 30, 1888...	Castro, 584 feet S from Thirtieth.................	....	429
No. 1947....	Jan. 30, 1888...	Castro, 900 feet S from Thirtieth.................	....	492
No. 1947....	Jan. 30, 1888...	Castro, 1,104 feet S from Thirtieth...........	....	465
No. 1947....	Jan. 30, 1888...	Castro, 1,168 feet S from Thirtieth...............	....	463
No. 1947....	Jan. 30, 1888...	Castro, 1,688 feet S from Thirtieth...............	....	359
No. 1947....	Jan. 30, 1888...	Castro, 1,752 feet S from Thirtieth...............	....	353
No. 1947....	Jan. 30, 1888...	Castro, 2,272 feet S from Thirtieth...............	....	247
No. 1947....	Jan. 30, 1888...	Castro, 2,336 feet S from Thirtieth...............	....	241
No. 1947....	Jan. 30, 1888...	Castro, 2,600 feet S from Thirtieth.	.. ..	185
No. 1948...	Feb. 8, 1888....	Castro, S line of Twenty seventh..................	330	332
No 1948....	Feb. 8, 1888....	Castro, N line of Duncan..........................	....	377
No. 1948....	Feb. 8, 1888....	Castro, S line of Duncan..........................	....	381
No. 1948....	Feb. 8, 1888....	Castro, N line of Twenty-eighth..................	....	375
No. 1948....	Feb. 8, 1888....	Castro, S line of Twenty-eighth..................	....	365
No. 1948....	Feb. 8, 1888....	Castro, N line of Valley..........................	....	318
No. 1948....	Feb. 8, 1888....	Castro, S line of Valley..........................	....	308
No. 1948....	Feb. 8, 1888....	Castro, N line of Twenty-ninth.................	....	262
No. 1948....	Feb. 8, 1888....	Castro, S line of Twenty-ninth....................	....	260
No. 1948....	Feb. 8, 1888....	Castro, N line of Day.............................	....	269
No. 1948....	Feb. 8, 1888....	Castro, S line of Day.............................	....	273
No. 1948....	Feb. 8, 1888....	Crossing of Diamond and Duncan...................	....	380
No. 1948....	Feb. 8, 1888....	Crossing of Diamond and Twenty-eighth..........	....	430
No. 1948....	Feb. 8, 1888....	Crossing of Diamond and Valley..................	....	420

TABLE No. 3—CONTINUED.

GRADES CHANGED AND ESTABLISHED DURING THE YEAR.

ORDER.	DATE.	STREET.	ELEVATION.	
			Old.	New.
No. 1948....	Feb. 8, 1888....	Crossing of Diamond and Twenty-ninth...........	....	415
No. 1948....	Feb. 8, 1888....	Crossing of Diamond and Day	....	450
No. 1948....	Feb. 8, 1888....	Crossing of Diamond and Thirtieth................	....	470
No. 1948....	Feb. 8, 1888....	Crossing of Douglass and Duncan..................	....	515
No. 1948....	Feb. 8, 1888....	Crossing of Douglass and Twenty-eighth..........	....	533
No. 1948....	Feb. 8, 1888....	Crossing of Douglass and Valley..................	....	522
No. 1948....	Feb. 8. 1888....	Crossing of Douglass and Twenty-ninth...........	....	545
No. 1948....	Feb. 8, 1888....	Crossing of Douglass and Thirtieth................	....	655
No. 1948....	Feb. 8, 1888....	Centre line of Ellen and Twenty-seventh..........	....	596
No. 1648....	Feb. 8, 1888....	E line of Ellen and Twenty-seventh..............	....	592
No. 1948....	Feb. 8, 1888....	W line of Ellen and Twenty seventh....	....	600
No. 1948....	Feb. 8, 1888.. .	Crossing of Ellen and Duncan.....................	....	559
No. 1948....	Feb. 8, 1888....	Crossing of Ellen and Twenty-eighth..............	....	509
No. 1948....	Feb. 8, 1888....	Crossing of Ellen and Valley.....................	....	479
No. 1948....	Feb. 8, 1888....	Crossing of Ellen and Twenty-ninth..............	....	550
No. 1948....	Feb. 8, 1888....	Crossing of Ellen and Day........................	....	620
No. 1948....	Feb. 8, 1888....	Crossing of Ellen and Thirtieth..................	....	505
No. 1948....	Feb. 8, 1888....	Crossing of Bellevue and Twenty-seventh.........	....	673
No. 1948....	Feb. 8, 1888....	Crossing of Bellevue and Duncan..................	....	608
No. 1948....	Feb. 8, 1888....	Crossing of Bellevue and Twenty-eighth...........	....	513
No. 1948....	Feb. 8, 1888....	Crossing of Bellevue and Valley..................	....	428
No. 1948....	Feb. 8, 1888....	Crossing of Bellevue and Twenty-ninth.	....	410
No. 1948....	Feb. 8, 1888....	Crossing of Bellevue and Day.....................	....	400
No. 1948....	Feb. 8, 1888....	Crossing of Bellevue and Thirtieth...............	....	335
No. 1948....	Feb. 8, 1888....	Castro, 114 feet S of Duncan	....	394
No. 1948....	Feb. 8, 1888....	Castro, 104 feet S of Twenty-ninth...............	....	260
No. 1948....	.Feb. 8, 1888....	Twenty-seventh, 280 feet W of Ellen.............	....	645
No. 1948....	Feb. 8, 1888....	Duncan, 280 feet W of Castro............	....	356
No. 1948....	Feb. 8, 1888....	Valley, 280 feet W of Douglass	....	51
No. 1948....	Feb. 8, 1888....	Day, 70 feet W of Castro.........................	....	27
No. 1948....	Feb. 8, 1888....	Day, 35 feet W of Ellen..........................	....	620

TABLE No. 3—CONTINUED.

GRADES CHANGED AND ESTABLISHED DURING THE YEAR.

ORDER.	DATE.	STREET.	ELEVATION.	
			Old.	New.
No. 1948....	Feb. 8, 1888....	Thirtieth, 117 feet E of Douglass		655
No. 1948....	Feb. 8, 1888....	Thirtieth, 73 feet W of Douglass		655
No. 1948....	Feb. 8, 1888....	Twenty-seventh, 280 feet W of Castro		332
No. 1952....	Feb. 17, 1888...	Beaver, 240 feet W of Noe		156.50
No. 1952....	Feb. 17, 1888...	Filbert, midway between Hyde and Leavenworth.		270
No. 1962....	Mar. 15, 1888...	Fair Oaks, 122 feet S of Twenty-first		166
No. 1963....	Mar. 15, 1888...	Crossing Ridley and Devisadero		260
No. 1963....	Mar. 15, 1888...	Crossing Devisadero and Lloyd		253.50
No. 1964....	Mar. 20, 1888...	Wisconsin, 150 feet N from Sierra		269
No. 1965....	Mar. 28, 1888...	Crossing Point Lobos and Twentieth avenues		134
No. 1965....	Mar. 28, 1888...	Crossing Point Lobos and Twenty-first avenues		130
No. 1965....	Mar. 28, 1888...	Crossing Point Lobos and Twenty-second avenues		129
No. 1966....	Mar. 28, 1888...	Crossing Pacific avenue and Pierce	225	226
No. 1967....	Mar. 28, 1888...	Crossing Twenty-fourth and Harrison	40	42
No. 1969....	Apr. 14, 1888...	Ridley, 439 4-12 feet W Castro, being E line Emma		312
No. 1969....	Apr. 14, 1888...	Ridley, 492 4-12 feet W Castro, being W line Emma		318
No. 1969....	Apr. 14, 1888...	Fourteenth, 417 4½-12 feet W of Castro, being E line Emma		262
No. 1969....	Apr. 14, 1888...	Fourteenth, 470 4½-12 feet W of Castro. being W line Emma		266
No. 1969....	Apr. 14, 1888...	Emma, 269 feet N of Fourteenth		302.50
No. 1969....	Apr. 14, 1888...	Fourteenth, 460 feet W of Castro	266	Abolish'd
No. 1970....	Apr. 14, 1888...	Crossing Steiner and Union		54
No. 1970....	Apr. 14, 1888...	Crossing Steiner and Green		84
No. 1970....	Apr. 14, 1888...	Crossing Steiner and Vallejo		131
No. 1970....	Apr. 14, 1888...	Crossing Steiner and Broadway		176
No. 1972....	Apr. 10, 1888...	N line crossing of Sanchez and Twenty-second....	290	287
No. 1972....	Apr. 10, 1888...	S line crossing of Sanchez and Twenty-second....	290	284
No. 1972....	Apr. 10, 1888...	N line inter. of Sanchez and Alvarado		245
No. 1972....	Apr. 10, 1888...	S line inter. of Sanchez ond Alvarado		242
No. 1977....	May 12, 1888...	N line crossing of Sanchez and Twenty-first......	340	355
No. 1977....	May 12, 1888...	S line crossing of Sanchez and Twenty-first.......	340	360

TABLE No. 3—Concluded.

GRADES CHANGED AND ESTABLISHED DURING THE YEAR.

Order.	Date.	Street.	Elevation.	
			Old.	New.
No. 1977....	May 12, 1888...	Sanchez, 114 feet S from Twenty-first..............	....	354
No. 1977....	May 12, 1888...	N line crossing of Sanchez and Hill...............	....	334
No. 1977....	May 12, 1888...	S line crossing of Sanchez and Hill	....	329
No. 1977....	May 12, 1888...	W line crossing of Twenty-first and Church.......	226	230
No. 1977....	May 12, 1888...	Twenty-first, 280 feet W from Sanchez............	....	370
No. 1977....	May 12, 1888...	Hill, 170 feet W from Sanchez.....................	....	338
No. 1977....	May 12, 1888...	Hill, 150 feet E from Noe..........................	....	342
No. 1988....	June 12, 1888...	NW corner of Church and Fourteenth............	86	87
No. 1989....	June 12, 1888...	SW corner of Fulton and Fillmore...........	108	108.50
No. 1990....	June 23, 1888...	Crossing Cole and Page............................	250	253
No, 1992....	June 19, 1888...	Crossing Union and Lyon.........................	128	110

TABLE No. 4.

MISCELLANEOUS ORDERS.

ORDER.	DATE OF APPROVAL.	PURPOSE.
No. 1921....	July 9, 1887............	Declaring St. Mary's avenue an open public street, commencing at a stake on the northwestern side of the new San Francisco county road, etc., 60 feet in width.
No. 1922...	July 19, 1887...........	Amendatory of Sec. 27 of Order No. 1,588, relative to the construction of streets and sidewalks, and prohibiting the destruction or removal of street monuments.
No. 1935....	Oct. 25, 1887.......... ..	Declaring Hill street from Castro to Noe street to be an open public street, 64 feet wide by 560 feet long, being a portion of Mission Block No. 10.
No. 1937....	Nov. 19, 1887...........	Closing Olive avenue between Franklin and Gough streets.
No. 1945....	Dec. 23, 1887...........	Closing and vacating Clipper street between Guerrero and Fair Oaks streets.
No. 1946....	Dec. 31, 1887...........	Declaring Highland avenue, from Corbett road northeasterly to Falcon road, to be an open public street in Block 17 of the Market-street Homestead Association.
No. 1951....	Feb. 15, 1888...........	Changing and establishing the width of sidewalks on Twenty-fourth street, between Howard street and Potrero avenue—is hereby reduced three (3) feet and established at twelve (12) feet.
No. 1957....	Mar. 7, 1888............	Closing and vacating Laurel avenue, between Polk street and Van Ness Avenue.
No. 1959....	....	Declaring Newgrove avenue, from Twenty-seventh to Duncan street, to be an open public street, 228 feet long by 30 feet wide (265 feet west of Castro), in Block No. 178 of Horner's Addition.
No. 1971....	Apr. 3, 1888............	Changing the name of Jessie street, between Willows and Twenty-first streets, to San Carlos avenue.
No. 1973....	Apr. 7, 1888............	Widening Mission street, between Twenty-sixth street and the county line. Width increased to the uniform width of 82 feet 6 inches.
No. 1974....	Apr. 10, 1888......... ..	Changing and establishing the width of the sidewalk on the northeast side of Townsend street, between Sixth and Seventh streets—reduced ten (10) feet and established at nine (9) feet.
No. 1980....	May 15, 1888...........	Declaring Concord avenue, Allison avenue, Pope street and Cross street to be open public streets, in Bernal Homestead Association.
No. 1986....	June 19, 1888...........	Closing and vacating Andrews street, between Mission and Minna streets.
No. 1987....	June 21, 1888...........	Changing and establishing the width of the sidewalks on Bartlett street, between Twenty-first and Twenty-second streets—reduced two (2) feet and established at thirteen (13) feet.
No. 1991....	....	Declaring Erkson Court to be an open public street, 20x162 feet. in Western Addition Block No. 504.

CITY PROPERTY IN CHARGE OF THE OFFICE.

For a list of the city property in charge of this office I would refer you to my report of last year, as, with the exception of a few note-books, no additional city property has been acquired. Such instruments as were necessary having been furnished by your surveyor at his private expense.

In conclusion I will state that I have curtailed the main body of this report in order to have room for the discussion of the question which not only concerns the present and future prosperity of our city, but approaches the very doors of our homes, causing each individual member of our community to consider this, the proper sewering of our city, as a matter for his personal consideration. The treatment of this subject will be found in the attached appendix.

Very respectfully,

S. HARRISON SMITH, City and County Surveyor.

APPENDIX TO REPORT

OF THE

SURVEYOR OF THE CITY AND COUNTY OF SAN FRANCISCO,

FOR THE FISCAL YEAR ENDING JUNE 30, 1888.

GENERAL PRINCIPLES OF SEWERAGE,

AND THEIR APPLICATION TO THE CITY OF SAN FRANCISCO.

The most important subject with which we have to deal is that of sewerage, and I have been fully aware of its importance from the very beginning of my administration of the affairs of this office, and that something on my part should be done to arouse not only your honorable body but also the community at large to a realization of the condition of and the dangers attendant upon our present methods of procedure and construction.

I have heretofore hesitated only because to place this matter before you in a proper light required much thought and a detailed study of the ground, for the accomplishment of which, added to my official duties, I have had very limited time. But I now feel that the urgency of the case demands some immediate action, and therefore present for your consideration the results of such investigations as I have been able to make.

I am aware that several reports upon this subject have been submitted to preceding Boards without any practical results, but I think this must have been in some part due to the writers' methods of treating the subject, viz: by simply giving results without first stating the general laws governing sanitary science, and thereby enabling the reader to follow the argument more intelligently. Although this seems to have been the method in vogue with engineers all over the country, it appears to me an ill-advised course to pursue when presenting a subject for the consideration of an enlightened community. I have therefore tried to lay a foundation for every suggestion, at the same time eliminating as much as possible all scientific discussion, and can only trust that I have put the matter in such a light that any intelligent person who will follow this report step by step, cannot help but understand the importance of the subject and the necessity for immediate action.

No credit is claimed for any new methods of construction or plan, nor have any new methods or theories been sought after, the object being to confine this report to such theories and plans as have been almost universally accepted as the best, and all suggestions made in this report are based upon theories that have passed beyond an experimental stage, and plans that have heretofore proved successful.

Nor have I hesitated, in discussing the principles involved in sanitary science, to quote at length any of the authorities on these points, the object being not alone to express my own views on the subject, but to show the necessity of adopting the principles generally laid down. Neither have I hesitated to consult with other engineers upon the application of these principles to our city, but a recognition of these services will be found in its proper place. I will also here state that in this Report no attempt has been made to estimate accurately the cost or dimensions of any proposed work, as considerable additional data was found necessary for this purpose, which could not be obtained except at an expense beyond my means. I have therefore only attempted to point out the general alignment of works that should be followed, were it determined to undertake any improvement of our system, and where any figures are given they are very approximate and should be so considered.

And now, begging your hearty and earnest consideration for the following few pages of this report, I will proceed with the subject.

SANITARY SCIENCE.

Sanitary Science, as at present understood, is of comparatively recent origin, although works for sanitary purposes are found which date their time of construction before the Christian era. Traces of very ancient works of this kind are found in Rome and other parts of Italy; in Spain, France, Germany, England, and also in Jerusalem. After the fall of the Roman Empire this class of construction seems to have been discontinued, and those works that existed were neglected. About the end of the Seventeenth Century some attention was again paid to this class of works; but it is only within the last few years that scientific men have turned their attention to this subject, and it is to their investigations that we are now indebted for the knowledge we possess of the benefits to be derived from properly constructed sanitary works, and the great danger that exists for any community from imperfection in plan or construction.

The importance of sanitary works has caused many engineers to make this class of construction an especial study, known as Sanitary Engineering. This, as defined by Mr. J. W. Adams in his work entitled "Sewers and Drains for Populous Districts," "consists in the constructions which are called for in facilitating the purification of the air, removing dangerous impurities from water, supplying an abundance of both of these life-giving elements, and removing, as speedily as possible, before decomposition commences, all refuse matter, whether of animal or vegetable origin."

Thus, if we consider the best methods for accomplishing the speedy removal of all objectionable matter from the neighborhood of our dwellings, and its disposal, so as not to injuriously affect our surroundings, either by polluting the waters or defiling the land, we can safely discard the consideration of the remaining objects of this science, as they will be the natural result of the proper accomplishment of this one.

The desirability of perfect drainage, and the speedy removal of all matter liable to decomposition, has been placed before the public so frequently of late that it is hardly necessary here to attempt a discussion of the subject. But it might not be out of place to introduce a table compiled from data given by Mr. Samuel M. Gray, in his report proposing a plan of sewerage for the City of Providence:

TABLE SHOWING RATE OF DEATH FROM ENTERIC FEVER FOR QUINQUENNIAL PERIODS IN CERTAIN EUROPEAN CITIES AND TOWNS BEFORE AND AFTER THE INTRODUCTION OF SANITARY WORKS.

NAME OF CITY OR TOWN.	No. Sanitary Reg.	No. Sewerage.	Partial Sanitary Reg.	Sewerage Complete.	No. Inhabitants for which per cent is given.
Munich	24.2	16.8	13.3	8.7	1,000,000
Frankfort-on-Main	....	8.7	....	2.4	10,000
Dantzic	108.0	90.0	....	18.0	100,000
Hamburg	....	48.5	....	13.3	Death rate enteric fever per 1000 total deaths.

Many other writers on this subject give tables showing the reduction of the death rate after the construction of sanitary works, but it is hardly necessary to quote these. Suffice it to say that all investigation on this subject tends to show not only a great reduction in the actual death rate, but also a great reduction in the number of cases of sickness from various kinds of disease, and there can be no doubt of the fact that the establishment of proper works for the abatement of these evils tends to improve the health of the population, and to increase the mental and bodily vigor of the individual inhabitant, thus increasing his capacities to labor, to endure, and to improve his condition, and thereby becoming a source of increased prosperity to the community. Thus, indirectly, we have a pecuniary gain.

SEWERAGE AND DRAINAGE.

Having now briefly examined the objects of Sanitary Science and determined upon the importance of constructing works for these purposes, it next devolves upon us to look into the best methods of accomplishing this end. We have decided that the other objects of this science will be accomplished if a proper system of sewerage and drainage is provided. "The word sewerage (says Mr. Gray) is commonly understood as meaning the foul fluids that are conveyed by sewers, and which vary in their offensive character from the fetid overflowings of privies, to the diluted liquids found in the sewers of large cities. Its meaning, however, is extended in sanitary discussions to include the more solid forms of excrement and filth, without regard to the degree of their dilution or the possibility of their removal by flow. It does not, however, include those solid refuse matters which may be used for animal food, as kitchen garbage, nor those which, like ashes, have no tendency to decomposition."

However, for our purposes, I thing it proper to use the word sewage as implying all kinds of solid and fluid material, which it is customary for, or likely that, any inhabited house or houses may contribute to the supply in the public sewers, exclusive of drainage. By drainage I mean such waters (for which we have to provide) as are derived from natural sources other than sewage, such as rain and storm waters falling upon our streets, houses and gardens, together with water from springs, natural water courses and waters retained in the subsoil.

Many plans have been adopted for the disposal of sewage, and many systems tried. The elements have in turn been called into use—Fire, Air, Earth and Water. Fire, to consume the material before decomposition sets in ; earth, to assist in deodorizing the material and to preserve its properties as a manure ; air and water, as mediums for transporting the material to a point of safe discharge. But it is unnecessary to enter into a detailed account of the different methods of applying these elements, as full accounts of such application can be found in the works of almost any of the modern writers upon this subject ; and since we have allowed that the speedy and complete removal of all objectionable matter from the neighborhood of our dwellings is the main and primary object of any system of sewerage, the fire and earth systems become of little or no moment. We may, therefore, confine ourselves to the two known as the Pneumatic or Air, and the Water Carriage systems.

PNEUMATIC SYSTEMS.

The object generally proposed in the Pneumatic System is the centralization or collection of the sewage into some principal station or reservoir. There are numerous methods of applying air to the removal of sewage. These are generally known by the names of their inventors. The principal among these are the Liernur, the Berlier and the Shone systems.

THE LIERNUR SYSTEM is the one most generally known, but it is not necssary here to enter into its details, it being sufficient to state that it is expensive and requires constant attention.

THE BERLIER SYSTEM is a more modern plan than the Liernur. It has been introduced into Paris to a limited extent on trial, and the advisability of its adoption is hardly yet an established fact. It would appear to be an expensivesystem, at best, and hardly applicable where other methods can be employed.

THE SHONE SYSTEM, although usually considered as one of the pneumatic systems, is really a combination of one branch of the Water Carriage System, with air pumps for raising the sewage. It was designed by Mr. Isaac Shone, a Welsh engineer. This system is most applicable where the successive raising of the sewage for small heights is necessary, as for example, a locality where the surface fall is not sufficient to create the velocity necessary for self-cleaning sewers, and where, for this reason, it is inpracticable to carry the sewage to one pumping station, or to an outfall sewer. In such a case any necessary grade is given to the sewers, and when an excessive depth below the surface is reached, the sewage is raised by the direct action of compressed air to a sewer placed at a higher elevation, through which it continues by the action of gravity toward the point where it again becomes necessary to raise it. This system is in successful operation in several places in England, among which are the Houses of Parliament.

We have now glanced at the principal pneumatic systems, and I think we may safely say that they are generally more expensive in primary construction and yearly attendance than the Water Carriage System. Yet there are many conditions which may render their use not only practicable but also desirable.

THE WATER CARRIAGE SYSTEM.

This system, which is generally accepted by prominent sanitary engineers as being the one most liable to give satisfactory results, is in reality the only practical method under ordinary conditions. It depends for its success upon the amount of water used by the inhabitants of a city for household purposes, which in most modern cities is sufficient to accomplish satisfactory results; in fact, its volume is generally so much in excess of that of the solid refuse matter discharged into the sewers, that in designing works it alone (exclusive of the solid matter) may be taken into consideration when calculating the size of sewers necessary to drain any district. This general system is divided into two classes, or sub-systems, known respectively as the separate and combined systems, a classification denoting the method or application, in the former the sewage being separated from and carried off in different channels to those employed for the drainage, and in the latter provision being made for carrying the combined volume of sewage and drainage in the same channels. The general laws governing one are, in most cases, applicable to the other, so that it is hardly advisable to separate them in the consideration of this system, until the time comes when it shall be found necessary to decide between the two in their application to some special locality.

It is often found desirable to use a combination of the two classes in planning works of sewerage for any city or town, the separate system being especially applicable when it becomes necessary to raise the sewage by pumping or where it is proposed to use it for manure. The combined system, however, being the one mostly in use in American cities and towns, it is generally found advisable and more economical to continue its use, and only make such improvements or additions as the exigences of the circumstances may require.

Mr. Adams, in his work upon sewers and drains, seems to incline very much towards the combined system wherever practicable, although in no wise condemning the other, and in referring to the use or non-use of the separate system, he says: "If the double system of conduits referred to are recommended, as they have been, on the score of preserving the rainfall uncontaminated with house sewage with a view to its ultimate use as a feeder to the streams to be utilized for domestic purposes, which is the strongest plea which can be offered for the increased expense attending a double system of drains, this and the increased commercial value of the house sewage, undiluted by rainfall, it can be answered that the rainfall collected in the gutters of a city, charged as it frequently is with atmospheric and other impurities, differs on analysis in no essential from house sewage."

The following are the principal points to be considered in designing a plan for sewering any district:

The area, the topography of the district (including its geological character and the depth below the surface which it is proposed to drain), the rainfall, the water supply, the final disposal of the sewage and the character of existing works, if any.

Topography.—With reference to physical outlines or topography, it can only be said that a great variety of conditions occur; from the elevated, hilly plateau, intersected by valleys of natural drainage (which presents one of the simplest forms of the problem), to the more complicated conditions, where hills and valleys are combined with extensive level stretches between them, and the natural outfall giving little or no chance for a safe and satisfactory point of discharge. It is in such cases as the last, where these combined conditions of topography exist, that the principle of the interception of sewage has been used to the greatest advantage. This system has been most satisfactorily illustrated in the latest sewerage works of London.

The depth at which it is required to place sewers below the surface of the street, is greatly dependent upon the custom and wishes of the inhabitants of a city or town. Most writers on the subject give from 12 to 14 feet as the proper depth; I consider 9 or 10 feet to be sufficient in the dwelling portion of most cities, where the surface is at any considerable elevation, and where the ground is free from moisture, and about 12 to 14 feet to be sufficient in the business portions, or where the soil contains any considerable amount of moisture.

Rainfall.—Under this head it is necessary to consider the amount of rainfall in a unit of time; the duration of the storms to be provided for. and the nature of the surface receiving the fall.

There is little doubt that if the water falling upon our streets, gardens, etc., could be excluded from properly constructed sewers, they would become self-cleansing; but to accomplish this result, as before stated, would require a separate system of drains for the sewage and for the drainage, and this would lead to considerably increased expense. In considering the factor of rainfall, we have less to do with the yearly amount than with the maximum amount falling in the unit of time, and the consideration of such storms as extend over a period of time greater than that required for the collection of the water, its entrance into and discharge from the sewer. Thus, two inches of rain falling in an hour for one hour, would not necessitate the construction of such drains as would be required for a lighter storm extending over a longer period of time, for in the first case the drains in the lower portions of a district have discharged long before the waters from the upper levels have reached them. But it seems to be a matter of some difficulty to obtain such data as would be desirable in this connection, as most records of the rainfall have only the total amount falling during the twenty-four hours—no note being made of especially heavy falls for shorter times during these periods. A rainfall of one inch in one hour seems to be accepted by most sanitary engineers as the maximum to be generally provided for, and here I shall quote an extract from the Report of the Engineer to Commissioners of Drainage, Brooklyn:

"No system of sewerage yet proposed in any city contemplates the removal of *excessive* storm waters by means of the sewers alone—such storms, for instance, as discharge for short intervals two or three inches of rain in the hour. These occur at long intervals and are of short duration, and the drainage is usually confined to limited areas; whilst the construction of sewers to meet the contingency would be attended with an enormous expense over the whole city, both in construction and repair, and prove of doubtful efficiency when suddenly called upon, and extremely objectionable as conduits for the ordinary flow of sewage."

We find, too, that much depends upon the character of the surface receiving the rainfall, whether paved or otherwise, if built upon the proportion of the area so covered, and the extent of gardens, etc., the inclination of the surface and its geological formation, for upon these conditions depends, to a great extent, the time for the rainfall to reach the sewers, and the amount of such rainfall ultimately contributed.

WATER SUPPLY.

The water supply of a city or town forms one of the most important factors in the problem of sewerage, as that portion of it used for household purposes constitutes the bulk, and its volume, in fact, may be considered as being the entire volume of the sewage.

It has been estimated by Mr. Adams that the house sewage will average 1,000 pounds yearly per inhabitant, or in bulk 120 gallons, equal to 16 cubic feet yearly, or 44-1000 of a cubic foot daily. While the supply of water used for house purposes is, say 20 gallons daily per head, or 2 66-100 cubic feet, which is about 60 times the bulk of the sewage.

FINAL DISPOSAL.

Many plans have been proposed for the profitable disposal of sewage, by using it for irrigation or separating the solids from the fluids for use as a manure, but in any city where a proper outfall can be obtained, or where it can in any manner be wasted without injury to person or property, experience has shown that it is less expensive, and generally a safer plan so to arrange, and to make no attempt to realize from its mercantile value. This, of course, calls for a proper and safe point of discharge, which it is not always possible to obtain, but in most cities near tide water this result can generally be accomplished, either by well constructed gravity outfalls, or by raising the sewage to slight elevations. We may therefore conclude that in general it is advisable to dispose of this pernicious matter in as speedy and safe a manner as possible, and not look to the works of sewerage as a source of possible revenue.

CHARACTER OF EXISTING WORKS.

In contemplating the construction of sewerage works, one of the first steps to be taken is is a thorough examination of any existing works for this purpose, for it is frequently found that works constructed apparently without system or plan, with little or no reference to existing conditions, and which would, at first glance, appear worse than useless, may, with little expense, be so altered as to perform the work required of them in a perfectly satisfactory manner. This is especially the case in districts where any considerable slopes exist, and where a perfect system of interception can be constructed.

MATERIALS USED IN CONSTRUCTION.

To consider carefully the different materials used in the construction of sewers would open up a field of discussion too extensive to be creditably attempted in a report of this kind. Suffice it therefore to say that they should be, one and all, of the best quality obtainable of their kind, and should be carefully handled by good and skillful workmen.

MAIN PRINCIPLES THAT SHOULD BE FOLLOWED IN LAYING A SYSTEM OF DRAINS.

1st. All sewers should be laid on as straight lines as possible, and their slopes should be perfectly even and uniform. Where any change of direction becomes necessary it should be accomplished by means of easy curves, and a manhole should be placed at each point of tangency (or end of curve). Connections between main and lateral sewers should be carefully made in the same manner, an increased slope being given to the sewer throughout the entire length of the curve. These conditions are especially applicable to pipe sewers, and where the pipe is smaller than fourteen inches in diameter the connection should be made inside the manhole.

2d. The shape and dimensions of each sewer should be so planned as to accomplish fully and thoroughly the maximum amount of work required of it, and yet at the same time to have sufficient velocity during the time of minimum flow that it will be self-cleansing. However, attention must also be paid to the fact that when the calculated size required for a sewer falls below ten inches in diameter, the danger of its becoming clogged is greatly increased; and for general practice in a combined system of sewerage and drainage I would not recommend for street use a size of smaller diameter than ten inches. In the separate system smaller pipes are often used.

3d. One of the most pernicious habits in constructing sewers is the provision of frequent drops or chambers below the general slope of the bottom, with the idea of catching the heavier materials and thereby preventing any stoppage in the flow. But this accomplishes no such result, but is only an obstruction to the rapid discharge, and endangers the health of the community by the collection of a certain amount of decaying material, which is seldom if ever removed. *Care should therefore be taken that in passing through a manhole the sewage is confined to as narrow a channel as before its entrance, and that the bottom of the manhole be smooth and on a uniform slope with that of the rest of the sewer.*

A very common error in designing a system of sewerage is to calculate the size of sewers as if they were to work under pressure. This will hardly, if ever, be the case.

4th. All house connections and plumbing should be executed with the greatest care and controlled by law, careful provision being made so that a perfectly free circulation of air should be kept up through the building and between the air in the street sewer and that above the roof. For making connections with the sewer Y joints of pipe should always be used, and not T joints as is frequently the case, as the latter give rise to eddies which it were better to avoid. This subject of house sewerage is one of the most important considerations connected with any system of sewerage, as where carried out properly and uniformly it gives the most efficient and practical method of ventilation.

SUGGESTIONS FOR THE IMPROVEMENT OF THE SEWERAGE OF SAN FRANCISCO.

Having now briefly considered the general principles involved in designing and objects to be attained by the construction of a perfect system of sewerage, we will next turn our attention to the application of these principles to our city.

In considering this subject many obstacles are met with which at first appear to be slmost insurmountable. Principal among these may be mentioned the faulty construction and plans of the present existing sewers and the ill-advised establishment of grades. These causes, I must say, are not (as might at first be supposed) attributable to the bad judgment or neglect of your engineers (who, indeed, have never had much control over such matters) but rather to the fact that heretofore a majority of the property owners in any block have been allowed to change grades or to construct sewers such as seemed most advantageous to them and the Superindent of Streets, in many instances economy of construction or grading being the principal consideration, and for the saving of a few dollars the most imperfect work has been the result. But these obstacles, which at first seemed almost insurmountable, have, I think, in most cases been successfully overcome by a careful study of such recorded data as was obtainable and such examinations in the field as it was practicable to obtain during the course of my daily work, and I think that the following suggestions as to general principles will have to govern any successful and economical plan for draining our city.

In arriving at my conclusions I have not thought it advisable to depend altogether upon my own unsupported judgment, but have consulted Mr. L. J. Le Conte, whose abilities are too well known in his profession to requir- comment from me. And, as he has given his assistance out of pure love of his profession and interest in the wellfare of our city, I feel that a full recogenition of his services is due here.

I had at first proposed to embody in this report all the obtainable data bearing upon this subject, but as I progressed I discovered that the subject assumed such tremendous proportions, the data being so voluminous and much of it unreliable, that to sift the useless from the useful, to tabulate and put it into any intelligible form, would require much time and space and be attended with considerable expense. I will, therefore, be obliged to ask the acceptance of many conditions as facts, dependent alone upon my statement that such is the case.

The first point that presents itself for consideration is a proper outfall or point of discharge. If this can be so situated that the sewage can be carried there and discharged by gravity a great point is gained. If not, some device must be resorted to for raising the sewage to a proper elevation. The conditions governing the selection of this point are:

1st That it be so located as to give the greatest facilities for the rapid and most continuous discharge of the sewage.

2d. That it shall be tide-locked for the shortest possible space of time after the turn of the tide.

3d. That when the sewage is discharged it shall be removed far and rapidly away, and with as little injury to the surrounding shore as possible.

Our present system, as is well known, has no particular outfall, but discharges the greater portion of the sewage from the southern and southeastern portions of the city, through two main conduits, into the upper portion of Islais creek and Channel street (formerly Mission creek), the sewage from the remainder of the city being discharged as best it can between or under the wharves at the foot of the different streets, causing along the entire length of our water-front an accumulation of filth very injurious to the health of any community, for the scouring capacity of the tide is greatly diminished at these outfalls by the obstacles in its way, such as the wharves themselves and the shipping moored to them or lying in the adjacent stream. Then, owing to the low grade of our streets in the vicinity of the water-front, our sewers are, for long periods of time during each tide, filled for many blocks with water and sewage, from which (even when they do not overflow into adjacent cellars) more or less foul gas is evolved, which rises, and passing along the sewers to their higher portions is discharged into the very midst of our dwellings. Thus we see an immediate necessity for the provision of proper outfalls.

A detailed examination into the state of existing sewers shows, first, a want of calculation as to size, the present sewers in most cases being too large for the work required of them. We also find (even in our principal channels) abrupt changes of grade. from one of excessive slope to one absolutely level. This is almost invariably the case at all street crossings. Add to this the fact that all our sewer connections are made at right-angles (and not, as recommended, on easy curves) and we have a state of sewer construction whose faults it only requires common intelligence to perceive. It is a well known fact that a velocity of at least from two to three feet per second must be maintained in any sewer to make it self-cleansing, and this can hardly be expected with the above conditions, as there is a change of velocity with every change of slope, and the water is checked and material backed up by the crossing stream at every intersection. This is the condition in our larger sewers. In our smaller pipe drains it is even worse. Here, not satisfied with the above fallacies of construction, they have also introduced large brick-work chambers, not only at all street crossings, but also at every manhole, the bottom of all brick-work being from six inches to two feet below the grade of the bottom of the pipe. This feature is not alone dangerous in that it collects refuse and retains it until cleaned out by hand, but it also increases the chances of the pipe being choked (which catastrophe these chambers are designed to prevent).

In a report of this kind there is little space for entering into the methods of correcting these details. Suffice it therefore to say that they can be partially, if not entirely corrected, at least to such an extent as to make the sewers work in a satisfactory manner, and that, too, at a very reasonable expense.

Thus, having glanced at the present condition of our drains, and found them anything but satisfactory, the next consideration is as to some way of improving their condition. This, I think, can be accomplished by following the general plan adopted for the city of Boston, some years ago, when it was discovered to be in a somewhat similar condition. Luckily for us, however, it will not be necessary for us to use the same expensive means to accomplish similar results.

The plan adopted for Boston was the construction of a system of large sewers, extending with their branches into all the drainage districts of the city, intercepting their sewage and conducting it to one point where it is pumped through a tunnel under the bay to a safe outfall on one of the neighboring islands. These sewers and their branches were and are, I believe, still known as the "Main Drainage Works of Boston."

MAIN DRAINAGE WORKS OF SAN FRANCISCO.

For the application of this principle of interception to San Francisco, a close study of the topography was necessary, and from this study it was found that the portion of the city most thickly populated, and over which it was considered necessary to extend these examinations, at the present time contains about 11,419 acres of land, and can be divided into six main drainage districts, each having its great intercepting sewer, with its main subdistrict branches, and five out of the six having separate outfalls. These six main drainage districts I have called districts "A," "B," "C," "D," "E" and "F," and will examine separately.

DISTRICT "A."

This district embraces most of the city lying north of Clay street, and between the Presidio Reservation on the west and Jones street on the east. Here there is a general and rapid descent in a northerly direction towards the bay, which presents the problem in its most simple form; and here, too, we find the existing works in a fair shape for utilization in the proposed plan. I would therefore suggest that the present 3x5 feet egg-shaped sewer extending from the divide at the intersection of Polk and Washington streets along Polk to Vallejo, thence along Vallejo to Franklin, be continued from this point along Franklin to Filbert; thence along Filbert to Gough; thence along Gough to Lombard; and thence along Lombard to a connection with the existing sewer at the intersection of Lombard and Octavia (this we will call district sewer No. 1); from this point the sewage will flow through the present channel along Lombard street to Laguna, where it will be joined by district sewer No. 2; thence along Lombarrd to Fillmore, where it will be joined by district sewer No. 3; thence along Fillmore street to Francisco, where district sewer No 4 will enter; and thence along Fillmore to an outfall.

It may, at some future time) when this section is built out to the ultimate water front), become necessary either to extend this sewer to these limits, or it can be carried round to a junction with the "great interceptor" from District "B," at its outfall at Black Point; but in either case it will be necessary to construct a branch sewer along Tonquin or Jefferson streets, as it is never advisable to allow any channel smaller than a district sewer to enter these great interceptors. The total area to be ultimately drained in this district is about 903 acres. To perfect the drainage of this section it would, at present, be necessary to build about 10,000 feet of sewer. A fair estimate of the cost for this (including outfall, necessary alterations and repairs to existing branches to be used as district sewers) would be about $47,000.

DISTRICT "B."

This district includes within its boundaries a greater portion of the city north of Market street, and between Sansome and Larkin; also that portion which lies north of Market, south of Washington, west of Larkin and east of the divide, which extends from the southeast corner of the Presidio Reservation southerly to the crossing of Stanyan and Fulton; thence to Frederick and Coie; thence to Market and Dolores. Also a narrow strip south of Market street.

The sewers suggested for this district are: The extention of the present sewer in Waller street from Fillmore street east along Waller to Market. (Seven hundred feet of this sewer will be in tunnel.)

At this point will be the head of the great interceptor for this district, which will here receive the sewage from 582 acres, be circular in form and five feet six inches in diameter. This great interceptor will extend northeasterly along Market street to Polk, where it will connect with district sewer No. 2 coming from the north and bringing in the sewage from about 231 acres. This would require an increase in the size of the interceptor to six feet three inches diameter; from this point it will still continue along Market street to McAllister, where district sewer No. 3 will join it, bringing in the drainage from some 871 acres, and the interceptor will be enlarged to a diameter of seven feet ten inches.

From here it will still continue along Market street to Turk, where district sewer No. 4 comes in, draining about 461 acres, and the interceptor will again be enlarged to eight feet seven inches diameter. From here it will pass along Market to Kearny street, and turning into Kearny will receive district sewer No. 5, bringing in the drainage from about 145 acres, and causing the interceptor to be increased in size to eight feet nine inches. From here the interceptor will extend along Kearny street to the intersection of Montgomery avenue, where it will receive district sewer No. 6, bringing in the drainage from about 208 acres, which will cause the size of the interceptor to be increased to nine feet in diameter. From this point the great interceptor is carried in tunnel along under Montgomery avenue to Lombard street, where it will receive the last district sewer, No. 7, which will cause a final increase to the size of nine feet four inches in diameter, which size will continue to the outfall at or near Black Point.

The entire length of this sewer will be about 19,300 feet, and will drain some 2,762 acres of land. A liberal estimate of the cost of constructing this great intercepting sewer may be put at about $643,000, including connections with district sewers, the extension of these district sewers, their modification and alteration where necessary; also the construction of such stone overflow weirs and gates for flushing low-lying districts, as may be required: but it does not include any modification or improvement in the condition of the small lateral sewers draining into these main district sewers.

The construction of such a sewer as here proposed would be of incalculable benefit to the community, for it would not only relieve the low flat districts (south of Market and east of Sansome street) from the annual inundation in great part due to the flood waters from the hilly districts during winter storms, but it would also relieve the upper or hilly portion of the city from the noxious exhalation of sewer gas, which is chiefly generated in the low flat districts; for it should be remembered that the hills are by nature free from the foul atmosphere and malarial influences peculiar to low lying lands, and and it is therefore manifestly unjust to continue a system of sewers such as transfers the gases generated in these low districts to those lying at a higher elevation and thereby jeopardizing the healthfulness and values of our principal residence property.

DISTRICT "C."

This district, covering an area of about 2,982 acres, presents one of the worst features of the drainage problem, consisting, as it does, of some 1,000 or 1,500 acres of the high, hilly lands of the Mission, with very rapid slopes towards the north and east, having below these slopes and between them and the natural outfall, large areas of almost absolutely level land.

It is therefore with some hesitation that I approach this portion of my subject. In examining the existing works in this district, I find many that have been built at considerable expense, both to adjacent property and also to the city at large. It has been my endeavor to utilize these works as far as possible, and although they do not meet my views in every respect, yet their existence and utilization will save great expense in intercepting the sewage from this district, and in all probability satisfactory results will be obtained. I would therefore suggest that the following plan be adopted and the necessary alterations, changes and connections be made:

That the 3x5-foot sewer in Church street be extended from Seventeenth street to a connection with the sewer in Eighteenth street. This will be the junction of district sewers Nos. 1 and 2, whose combined volume will represent the drainage from about 552 acres. This point will also be the head of the great interceptor for this district. From this point the sewage will flow through the old conduit in Eighteenth street to Mission, where it will be joined by district sewer No. 3; thence, the sewage still continuing in the old channel along Eighteenth street to Treat avenue, will be joined by district sewer No. 4, the combined volume contributed by these last two sewers being the drainage from some 653 acres.

From here the great interceptor will continue (utilizing the old Channel street sewer throughout its entire length) to a point near Potrero avenue, receiving during its course the two district sewers Nos. 5 and 6, bringing in respectively the drainage from about 31 and 361 acres.

From this point the great interceptor will be constructed down Brannan street to Fourth, where it will connect with the large sewer built some years ago in Brannan street, through which channel the sewage will flow from Fourth to First street, and thence to an outfall to be built well out beyond the adjacent wharves. Beteen Potrero avenue and the outfall this great interceptor will receive four additional district sewers, bringing the sum of the areas drained by this system to the grand total of about 2,982 acres.

Owing to the large area to be drained, and the small fall that exists between the end of the present sewer in Channel street at Potrero avenue and the head of the present Brannan street sewer at Fourth, some provision will have to be made for a proper storm water overflow at Potrero avenue, and with this provision the drainage facilities will be all that can be required for the present.

At some future time, when this section is more thickly populated, I would (for the same reasons as cause the suggestion of a storm overflow at Potrero avenue) advocate a further interception of the sewage from this district by means of a large sewer through the section south of Channel street. A fair cost of necessary construction in this district would be about $192,000.

DISTRICT "D."

This district, like the preceding, has a great difference in elevation between its higher and lower portions, but the descent is much more uniform and thereby the solution of the problem is greatly facilitated.

I have included in this district the greater portion of Horner's Addition proper, narrow strips of the Mission and the Precita valley lands, the principal part of the Potrero and about one-third of South San Francisco, thus covering an area of about 2,312 acres. In this, like district "C," we find old works that must be utilized, and although many of the objections that applied to the former will also apply here, yet taken as a whole they are in far better shape and capable of giving more satisfactory results. We have here one existing main channel known as the Army street sewer. This we will utilize throughout its entire length as our great interceptor for this district. It has its head at the intersection of Army and Guererro streets, where under the proposed system it will receive district sewer No. 1, bringing in the drainage from some 387 acres. At Valencia and Army streets, district sewer No. 2, draining about 234 acres, will enter this sewer. At Mission and

Army it will be joined by district sewer No 3, and at Potrero avenue and Army by district sewer No. 4.

The present Army street sewer extends but a short distance beyond this point. From its present end this sewer should be extended ultimately along Colusa street to an outfall at the water front. For the present, however, it will only of necessity have to be extended beyond Kentucky street, where it will be joined by district sewers Nos. 5 and 6, one draining a great portion of the Potrero and the other bringing in the drainage from a portion of South San Francisco.

To accomplish the above extention of the Army street sewer towards Pennsylvania avenue will require tunneling about 1,000 feet. From Pennsylvania avenue to Kentucky street (a distance of about 1,400 feet) Colusa street will have to be filled or the sewer carried across to Kentucky street on supports.

In my judgment Colusa street should be filled in throughout its entire length as soon as practicable, aad allowed to settle whilst the work of construction is being carried on in other sections of the city. This street, when filled, will in all probability require the lapse of several years before assuming permanent shape. The sewage should, in the meantime, be carried through in a box or barrel drain at least so far as to pass the fill at Kentucky street. In order that this sewer may accomplish the work here laid out it will be necessary to build it circular in form, seven feet in diameter between the present end and Kentucky street, nine feet eight inches in diameter between Kentucky and Delaware streets, and ten feet in diameter between Delaware street and the outfall. An estimate of the expense attending the completion of the above works is somewhat difficult of attainment, owing to the treacherous quality of the ground to be worked over, but the probabilities are that it can be relied on not to exceed $515,000.

In connection with the drainage of this district I would suggest that the following changes of grade be made:

Crossing of Fifth avenue and Penobscot(formerly "H") raised four feet, Fifth avenue and Santee (formerly "G") raised five feet, Railroad avenue and Manila raised two feet, Railroad avenue and Montenegro raised one and one-half feet, Railroad Avenue and Denmark raised one foot, Railroad avenue and Honduras raised six inches.

DISTRICT "E."

This district needs a thorough examination of existing works before any positive plan or line of main drainage can be recommended. There is no doubt that if the previously suggested works are carried out in the upper districts, this section will (at least with respect to the stormy season) be in a much better condition than at present.

It is true that storm weirs are proposed and gates fixed on the line of the great intercepting sewer of District "B," so that this district could be flushed from time to time; but even with these preparations it would still be in a very precarious condition. It is therefore suggested that investigation be made and some line for an interceptor be located, running from south to north, and collecting the material from the entire district, carrying it to a point at or near the intersection of Bay and Kearny streets, where it could be raised into a sewer in Bay street, which would flow by gravity westerly along Bay to a connection with the great interceptor of District "B." This would necessitate an enlargement of this interceptor, but would add little, if any, to the expense of its construction. This is the most expensive of all the districts, in comparison to the area drained. It is estimated that there will be required two pumping engines, costing $15,000 each, a pumping house, well, etc. (including ground), at $80,000. The necessary new mains, changes in old mains, etc., $95,000 more, making a total of $205,000. In estimating the capacity of the above engines, only the summer flow was considered, the plan being to arrange the sewers in this district so as to allow the storm waters to pass off (at least in part) through their old outfalls.

DISTRICT "F."

This district embraces all that section of the city west of District "B" and north of Golden Gate Park. From the fact that no grades have been established over that part of this district west of Twenty-third avenue, it is impossible to consider anything beyond that line. The natural features of this district, so far as known, tend greatly to facilitate its perfect drainage, and as it is a comparatively new section, and has no existing works to interfere with the perfect construction of the new, it were a shame to do any work until some plan is adopted for the entire district.

The following suggestions are made for the present, which, if carried out, could in no wise interfere with the future drainage:

A district sewer should be constructed in Point Lobos avenue, from the divide at or near Collins street to Ninth avenue, thence along Point Lobos avenue to Fourteenth avenue. The sewer should have a size corresponding to a circle of 4 feet 6 inches in diameter; thence along Fourteenth avenue to California street, and along California to Eighteenth avenue, and along Eighteenth avenue to Lake street. It should be a circle of 4 feet 10 inches in diameter. Thence along Lake street to Twenty-third avenue. The size should be increased to 5 feet 2 inches in diameter. From this point the direction would depend upon the nature of the ground and the right of way that could be obtained. The general direction should be north and west, and the sewer should be carried well above and away from Lobos Creek, from which a large portion of our water supply is obtained, and the outfall should be from one of the many points along this portion of our coast line. Of the other sewers that will have to be constructed in this section the principal one, heading on Point Lobos avenue, near Eighteenth avenue will pass along Point Lobos to Twenty-third, and down Twenty-third avenue to a junction with the previous one at Lake street. This would intercept all the drainage from the eastern slope of the hills west of Twenty-third avenue, and upon this, and the volume contributed by the previously described sewer, the size of the outfall would depend. Two more branches to the first sewer may be suggested—the first, starting on First avenue, near the Presidio line, would pass along First avenue to a junction with the Point Lobos sewer; the other, heading on Eighth avenue, near Point Lobos, would pass along Eighth avenue to Lake street; thence westerly along Lake street to join the sewer from Eighteenth avenue. A branch sewer would also have to be placed in Eighteenth avenue. from "D" street to Point Lobos avenue.

The length of sewer here required would be in the neighborhood of 35,000 feet, including outfall, and a fair estimate of the expense may be placed at $219,000.

CONCLUSION.

I have now glanced at the early history of sanitary science, briefly reviewed the methods from time to time adopted for carrying out its object, and arrived at the conclusion that the best method for accomplishing the desired result is that which "removes as speedily as possible, before decomposition commences, all refuse matter, whether of animal or vegetable origin," from the neighborhood of our dwellings. With this object continually in view, I have attempted to give some idea of the plans that should be followed. Thence I have turned to the consideration of the sewerage of San Francisco as it is, and made such suggestions for improvement as the exigencies of the situation seemed to me to call for. In this consideration the city has been divided into six main drainage districts, which cover all that portion of the city over which official grades have been established, and which is of necessity the limit of my examinations. And it has been found that a satisfactory system of main drainage works can be constructed at what appears to me a very reasonable expense, when compared to the benefits to be derived.

Some few of the constructions here suggested are such as would not have been suggested were an entirely new field under consideration; but the necessity of utilizing old works, and thereby saving very considerably in the expense of construction, has caused the adoption of these plans. As before stated, during this investigation much trouble was caused by the condition of the grade, but it will be noticed that notwithstanding all changes of grades have been avoided in the plans as submitted, except a few cases in South San Francisco, where the changes can cause no damage or inconvenience. It is also noticeable in these plans that there has been no recommendation of condemning property, except in the one instance near Lobos creek, and here, even if it were necessary to condemn the land, it should be the cause of very little expense, as no injury would be done to the property by allowing the sewer to pass under it far below the surface.

The following is a summary of the expense necessary to carry out these plans:

Construction necessary at present in district "A"	$ 47,000
Main sewer in district "B," including outfall connections with subdistrict sewers, etc	580,000
Alteration and necessary extension of subdistrict sewers	55,000
Strengthening arch at Fifth street	8,000
Entire construction necessary in district "C," including outfall	192,000
Entire construction necessary in district "D"	515,000
Engines for district "E"	30,000
Engine houses, pumping well, etc., including ground for houses	80,000
Estimated necessary sewer construction, etc	95,000
Entire construction necessary at present in district "F"	219,000
Add for engineering, superintendence and contingencies	137,000
Total estimated cost	$1,958,000

I would again state that this appears to me a very moderate expense for which to obtain what I am sure this plan would accomplish, viz: the complete and satisfactory solution of our drainage problem.

For the carrying out of this plan in a proper manner I would suggest that a competent engineer or engineers be appointed with full power to conduct it to a successful issue. To accomplish this they should have the entire control from the commencement of the work to its conclusion, when it could be turned over to the Street Department, where there should be a permanent deputy for each district, whose duty it should be to keep a careful watch over the entire system under his charge.

After this work is finished the engineers should be required to draw up careful plans and specifications for each and every block included in these districts, as well as general plans for the government of house sewerage, and these plans should be adopted as a law to govern further constructions.

In conclusion I will state that I have expended much careful study and thought upon this subject, and have no doubt as to the efficient working of the submitted plan, but I would impress it upon the minds of the members of your honorable body that no time is to be lost in taking hold of this matter, as the necessities of the city in this respect are growing greater and greater year by year, and some plan for the improvement of its sewerage system should be immediately adopted.

Maine
P. P. R.